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ABSTRACT

Papers presented in this conference report include: "Overview of Theories of Language Learning and Acquisition" (Diane Larsen-Freeman); "A Theory of Strategy-Oriented Language Development" (Michael Canale); "Motivation, Intelligence, and Access: A Theoretical Framework for the Education of Minority Language Students" (Edward De Avila); "Second Language Learning in Children: A Proposed Model" (Lily Wong Fillmore); "English Language Development through a Content-Based Approach" (Anna Uhl Chamot); "Competency Testing for Limited-English-Proficient Students" (Norman C. Gold); "Cognitive Development in Bilingual Instruction" (Kenji Hakuta); "Learning Strategy Applications to Content Instruction in Second Language Development" (J. Michael O'Malley); "University Models for ESL and Bilingual Teacher Training" (Virginia P. Collier); "Mathematics Education in a Second Language: An Instrumental and Teacher Education Model" (Gilbert J. Cuevas); "Some Common Components in Training Bilingual, ESL, Foreign Language, and Mainstream Teachers" (Denise McKeon); "Models of Inservice Teacher Training" (Carmen I. Mercado); and "Training Teachers to Develop the Academic Competence of LEP Students" (Muriel Saville-Troike). (MSE)

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Issues in English Language Development

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3

Contents

Preface vii

Theoretical Viewpoints

Introduction 3

"Overview of Theories of Language Learning and Acquisition"
Diane Larsen-Freeman 7

"A Theory of Strategy-Oriented Language Development"
Michael Canale 15

"Motivation, Intelligence, and Access: A Theoretical Framework for the Education of Minority Language Students"
Edward De Avila 21

"Second Language Learning in Children: A Proposed Model"
Lily Wong Fillmore 33

Instructional Implications for Students

Introduction 45

"English Language Development through a Content-Based Approach"
Anna Uhl Chamot 49

"Competency Testing for Limited-English-Proficient Students"
Norman C. Gold 57

"Cognitive Development in Bilingual Instruction"
Kenji Hakuta 63

"Learning Strategy Applications to Content Instruction in Second Language Development"
J. Michael O'Malley 69

Implications for Teachers

Introduction 77

"University Models for ESL and Bilingual Teacher Training"
Virginia P. Collier 81

"Mathematics Education in a Second Language: An Instrumental and Teacher Education Model"
Gilbert J. Cuevas 91
"Some Common Components in Training Bilingual, ESL, Foreign Language, and Mainstream Teachers"
Denise McKeon 97
"Models of Inservice Teacher Training"
Carmen I. Mercado 107
"Training Teachers To Develop the Academic Competence of LEP Students"
Muriel Saville-Troike 115

Preface

The papers in this publication were presented at a national information exchange entitled "Issues in English Language Development for Minority Language Education." The purpose of the gathering was to relate theoretical discussion on English language development for minority language students to classroom instruction and teacher training, while focusing on the total education of these students.

Held on July 24, 1985, in Rosslyn, Virginia, the information exchange was co-hosted by the National Clearinghouse for Bilingual Education (NCBE) and the Georgetown University Bilingual Education Service Center (GUBESC). Participants and guests included theorists, researchers, teacher trainers, and practitioners from across the United States.

Papers presented at the gathering were divided into three sessions: theoretical viewpoints, moderated by Michael Long; instructional implications for students, moderated by Scott Enright; and implications for teachers, moderated by John Staczek. NCBE would like to thank the moderators for their participation and for their contributions to the accompanying introductions written by NCBE staff members Gloria Stewner-Manzanares (Theoretical Viewpoints), Stefan Jaeger (Instructional Implications for Students), and Johanna Z. Provenzano (Implications for Teachers). We would also like to express our appreciation to the presenters for sharing their insights and to the NCBE and GUBESC staff for their efforts in organizing and managing this information exchange.

National Clearinghouse for Bilingual Education

Theoretical Viewpoints

Introduction

The four papers that follow approach the theme "theoretical viewpoints" from a variety of perspectives. Larsen-Freeman opens by giving an overview of several current language learning and acquisition models, comparing and contrasting the most salient aspects of each. Canale writes on a practice-driven theory that evolved from his experiences in Canadian classrooms, while two of the theoreticians, Wong Fillmore and De Avila, present their own models of language learning.

The overview by Larsen-Freeman on language learning and acquisition models includes discussions of numerous viewpoints: information processing (McLaughlin); acculturation (Schumann); the monitor model (Krashen); integration of linguistic, social, and cognitive knowledge (Hatch and Hawkins); and the interaction of the learners, the social context, and the users of the target language (Wong Fillmore and Swain). Canale presents his view of language learning as problem solving, a learning process involving the use of complex strategies that can be observed or inferred when problem solving communication tasks are given to students. Canale offers classroom activities that enhance the use of strategies and, by extension, second language learning. Analysis of these strategies can contribute to a theory of the language learning process.

De Avila offers a model that includes factors of motivation, cognition/intelligence, and access. De Avila believes that all three factors must be present for successful learning—including language learning—to take place. Motivation involves the students' interest in the learning task at hand (a task that should provide the student with a tangible purpose). Intelligence is defined as a student's ability to process and apply information that he or she already knows. Access implies that learners must have access not only to facilities but to higher order thinking skills as well. Improperly structured lessons can actually deny learners access to important concepts.

Wong Fillmore's (and Swain's) model also includes three components essential for successful language learning: (1) learners who are motivated to learn the target language; (2) the presence of native speakers of the target language; and (3) a social setting that brings learners and native speakers into frequent contact. In addition, Wong Fillmore identifies three types of processes involved in language learning: social, linguistic, and cognitive processes.

While the ideas and models presented in these papers appear to cover a wide range of issues, they do have important commonalities. The authors all agree that linguistic, cognitive, and sociopsychological factors are involved in second language learning. While De Avila focuses on cognitive and sociopsychological factors in his model by including components of motivation, intelligence, and access, Wong Fillmore includes linguistic factors such as the relationship of the first language to the target language, along with the cognitive and sociopsychological factors. Canale also acknowledges cognitive and sociopsychological factors in his paper, emphasizing the view of second language learning as problem solving in interactive situations.

A major commonality, therefore, is the view that cognition is central to second language learning. Wong Fillmore suggests that although skills such as inferencing and categorization do not play a major role in first language acquisition, they are of major use in second language learning. Canale supports this view by proposing that learners use specific strategies for second language learning; these strategies may involve complex schemas of consciously planned and executed actions. De Avila, moreover, believes that cognition is central to learning in general and that language learning is a by-product of interactions and activities involving higher order cognitive skills. In other words, second language learning requires the use of a subset of general cognitive skills.

Other issues arising from this view of cognition and second language learning are the roles of the teacher and student and that of the first language. As reported by Canale and De Avila, the teacher's role is to structure activities that require the use of cognitive strategies. The role of the learner is thus an active one involving the application not only of general cognitive skills and strategies but also those skills and strategies developed when learning the first language.

By bringing together the factors involved in second language learning, the models presented here provide a foundation for the future development of a complete theory. In addition, the models have practical implications for the teaching of minority language students. For example, the finding that contact with native speakers is necessary to promote second language growth (Wong Fillmore) can have a direct influence on the organizational pattern of the classroom. Wong Fillmore's argument that conscious learning is important in second language learning suggests that teaching the conscious use of language learning strategies can be of benefit to students. In contrast, Krashen's claim (as reported by Larsen-Freeman) that language proficiency is enhanced through acquisition and not conscious learning of grammar, implies that the latter activity does not improve a student's ability to communicate in the target language. According to Krashen, activities that supply comprehensible input enhance language proficiency. De Avila maintains that language learning is a by-

product of cooperative learning and the learning of higher order cognitive skills. Therefore, a focus on content in the classroom would supercede language instruction per se. Canale's recommendation of a problem solving approach to language learning would encourage the inclusion in the curriculum of activities such as those he describes.

While three major factors—linguistic, cognitive, and sociopsychological—have been highlighted in the models presented here, the papers show the complexity not only of the factors themselves, but also of their interaction. As moderator Michael Long pointed out, before one can begin to apply the ideas from these models to the classroom, the models and hypotheses underlying them need to be tested. A knowledge of how the many factors interact and the relative contribution of each to learning outcomes is essential for informed decisions on curriculum planning. While future research is essential, these models are a valuable step in creating a more complete and accurate picture of second language learning.

Presenters

Michael Canale is an associate professor in the Center for Franco-Ontarian Studies and the Curriculum Department at the Ontario Institute for Studies in Education. For the past ten years he has conducted studies on the education of minority language students. His publications and research are in the areas of language proficiency, language assessment, and competence in language learning.

Edward De Avila is president of De Avila, Duncan & Associates, also known as Linguametrics. His research emphasis has been on the relationship of language development and cognition in academic settings.

Lily Wong Fillmore is an associate professor of education in the Language and Literacy Division of the University of California at Berkeley. She is a linguist by training and for the past 12 years has been conducting second language research in school settings. Her most recently completed research is on cognitive and social processes in second language learning.

Diane Larsen-Freeman has been on the faculty of the Master of Arts in Teaching program at the School for International Training since 1978. Prior to this she was an assistant professor in the English Department at UCLA. She has a Ph.D. in linguistics from the University of Michigan. She was editor of the journal *Language Learning* from 1980 to 1985. She has also edited *Discourse Analysis in Second Language Research*, coauthored *The Grammar Book: An ESL/EFL Teacher's Course*, and authored *Techniques and Principles in Language Teaching*.

Moderator

Michael H. Long is an assistant professor of ESL at the University of Hawaii at Manoa. He is the coeditor of *Child-Adult Differences in Second Language Acquisition*, *Second Language Acquisition Studies*, and *Classroom-Oriented Research on Second Language Acquisition*.

Overview of Theories of Language Learning and Acquisition

Diane Larsen-Freeman

People have been interested in second language acquisition (SLA) since antiquity, but in recent times much of the research emphasis has, in fact, been placed on language *teaching*. In the early sixties, for example, large-scale studies comparing different language teaching methodologies were conducted. Much to the disappointment of advocates of one or another methodology, the results of the comparative studies proved to be inconclusive. Disillusioned by this finding and affected by the behaviorist versus cognitivist debate in psychology and the Chomskian revolution in linguistics, second language researchers' attention began to shift from the teaching process to the learning process. It was this shift in perspective which introduced a new research agenda and which gave definition to the field that has come to be known as second language acquisition (Larsen-Freeman and Long, forthcoming).

In order to attain their goal of facilitating bilingualism, SLA researchers realized that they would have to take into account, as a minimum, the following factors:

- The setting in which the learning/acquisition takes place (in a classroom or in an untutored environment; in a second language or in a foreign language context);
- Learner variables (age; aptitude; motivation; cognitive style; social, psychological, experiential, maturational, neurological, and personal factors);
- The nature of the target language to be acquired and the native language of the learner, and the similarities/differences between them;
- The reasons why the learning is being undertaken at all (to assimilate into a new cultural community, to travel as a tourist, to pass an examination, to obtain employment, to read scientific texts).

In sum, the scope of SLA research would have to be sufficiently broad to include a variety of learners who speak a variety of native languages,

who are in the process of acquiring a variety of second languages in a variety of settings for a variety of reasons (Larsen-Freeman and Long, forthcoming).

Given the enormous scope of the task, small wonder that much SLA research focuses on one relevant dimension or another of the SLA conundrum, rather than being multidimensional in nature. Thus, there are SLA researchers who operate mainly from a linguistic perspective. They assume that language learners possess certain innate language learning capacities that are activated in response to the target language input to which the learners are exposed. Other linguistic explanations are invoked as well. "It is clear that an explanatory account of L_2 acquisition cannot be given on the basis of the target language (TL) alone. There are additional factors that shape the progress of development. Two major ones have been suggested: language transfer and language universals" (Gass 1984, 115).

Other reseachers pursue an understanding of the SLA process from a social/psychological perspective. They seek to determine how characteristics of individual learners and groups of learners influence the rate and the ultimate level of proficiency attained in the second language. More precisely these researchers examine the language learning environments as well as the learners' attitude, intellectual abilities, personalities, or learning styles in order to identify the variable(s) that might explain the differential success which exists among learners (Lightbown 1984).

Still other researchers see cognition as central to an explanation of SLA. McLaughlin (1978), for example, proposes explanations for a general theory of human information processing. He specifically recommends the distinction between controlled and automatic processing be applied to the SLA context. He also discusses the usefulness of the concepts of schemata or syntactic infrastructures and discovery procedures or acquisition heuristics.

One of the earliest attempts to combine the perspectives from two of the three dimensions was Schumann's acculturation model. Schumann brings the linguistic and social/psychological dimensions together in his model. The social/psychological dimension is important in assessing the degree to which learners acculturate to the TL group. Schumann believes that the degree of acculturation controls the degree to which learners acquire the second language (Schumann 1978a). Social and psychological factors are seen by Schumann as constituting acculturation. The social factors include social dominance patterns, integration strategies, enclosure, cohesiveness and size, congruence, attitude, and the second language learning group's intended length of residence. The psychological factors in Schumann's model include language shock, culture shock, motivation, and ego permeability. Thus, learners who have a positive attitude towards speakers of the TL, who desire to integrate in-

to the community of speakers of the TL, and whose culture is congruent with the TL culture, among other factors, are likely to be more successful in acquiring the second language than learners not possessing these characteristics.

Schumann introduced the linguistic perspective in his model by asserting that the process of SLA on the one hand, and pidginization/decreolization on the other, were analogous. Early pidginization and beginning SLA both result from a language contact situation in which there is minimal acculturation. Decreolization and more advanced stages of SLA result from language contact situations where there is progressive acculturation leading to ultimate conformity to the TL norm (Schumann 1978b).

Perhaps the first model that addresses the complexity of SLA from a tridimensional linguistic, social/psychological, and cognitive perspective is Krashen's monitor theory. The five hypotheses that comprise the essence of the theory are as follows (Krashen 1982):

1. *The acquisition-learning hypothesis.* Adults have two distinct ways of developing competence in a second language: (1) by subconsciously acquiring, much as children acquire their mother tongues or (2) by learning—by the accumulation of conscious knowledge of the rules of the language.
2. *The natural order hypothesis.* The acquisition of grammatical structures proceeds in a predictable order for all second language acquirers of a given TL.
3. *The monitor hypothesis.* What learners have learned (as opposed to acquired) is used for only one purpose. It functions as a monitor to allow learners to make changes in the form of what they have spoken or written. Acquisition, on the other hand, "initiates" utterances in a second language and is responsible for fluency.
4. *The input hypothesis.* Learners acquire language by receiving comprehensible input and attending not to its form, but to its message. In order to progress in second language acquisition, the comprehensible input must contain some structures that are beyond the learners' current level of competence.
5. *The affective filter hypothesis.* A filter exists in each learner which screens the input to which the learner is being exposed. If the learner's attitudes are positive, more of the input will be received; if negative, the input will not be received as well by the language acquisition device (LAD).

The two central points of Krashen's monitor theory that emerge from these hypotheses are that acquisition is the more important of the two

processes leading to acquired competence and that two conditions are thought to be necessary for acquisition. The first is that learners must obtain comprehensible input that is a bit beyond their current acquired level of competence. The second is that successful learners need to have a low or weak affective filter which will let the input in.

Readers will note that the claim that Krashen's theory is tridimensional is due to the fact that hypotheses 1, 3, and 4 relate to the cognitive dimension, hypothesis 2 to the linguistic, and hypothesis 5 to the social/psychological dimensions.

Another model that addresses all three dimensions is Hatch and Hawkins's (in press) integrated model. Their particular approach to account for SLA involves the following premises:

1. There is an interactive relationship among the three internal mental systems of linguistic knowledge, social knowledge, and cognitive knowledge. Knowledge is accumulated by learners in such a way that knowledge acquisition in one area acts as a scaffolding upon which the other knowledge system can be built. This process operates reciprocally.
2. There also exists an interactive relationship between external experience and these three internal mental systems. The systems evolve from the interpretation of our experiences for ourselves and for others.
3. The way learners organize the events of their experience so as to make the events interpretable is to create scripts or sequences of events in a particular context. We have scripts for how to go grocery shopping, for instance. "The knowledge necessary to create scripts is basically social knowledge" (Hatch and Hawkins, in press); however, much language is associated with scripts. Thus, language building accompanies script building.
4. One possible way in which language building transpires is through Incremental Procedural Grammar, a semantically driven grammar. (In their paper the authors detail how the grammar fits into their model; space restrictions prevent further discussion here).

The last formulation to be considered is Wong Fillmore and Swain's. Like Hatch and Hawkins, they include in their model the linguistic, cognitive, and social dimensions in an interactive relationship. There are three essential components in their model, each with its own set of variables. The three components are the learner, the social context, and the users of the target language. The associated variables can affect "the rate, the course, and the ultimate outcome of learning. For example,

associated with the learner are such variables as personality, age, aptitude, motivation, and learning style. Associated with the social context are such variables as setting, social roles of the speakers, and status of the mother tongue and target language. And associated with the users of the target language are such variables as the expansions, repetitions, clarifications, and other such adjustments that the target language users make, the actual target language being used, and the relationship between the target language and the learner's first language" (Wong Fillmore and Swain 1984, part 1: 14–15).

The social processes in Wong Fillmore and Swain's model are those which bring learners together with target language speakers in a setting where communication in the target language can and does take place. Linguistic processes affect both learners and target language speakers. These processes involve the TL speakers' assumptions that "cause [the speakers] to select, modify, and support the linguistic data that get produced" (Wong Fillmore and Swain 1984, part 2: 1). The learners' assumptions affect the interpretations they give to linguistic data with which they are confronted. Cognitive processes include inference, categorization, and memory, among others. Language acquisition proceeds only when all three of these processes interact.

In conclusion, a final point regarding SLA and theory making is worth stating. A theory is a comprehensive, explicit, empirically verifiable account of what is known about a phenomenon.

According to Long (1985) there are two types of theories. The first type, termed a *set-of-laws theory,* summarizes what we *understand* about the phenomenon under investigation. It is a compilation of a series of (often related) statements that have been derived by repeated observations of relationships known to have an impact on the phenomenon. Each of these statements must be tested and validated independently. Furthermore, they must contain no unoperationalizable constructs.

The second type of theory seeks to *explain* the phenomenon under investigation. This type is termed a *causal-process theory.* The statements contained in causal-process theories are related and specify "not only *when* or *that* a process (such as SLA) will occur, but *how* and *why*" (Long 1985, 6). In order to explain a phenomenon, the statements will have to be comprehensive and testable.

Given either of these definitions, it is premature in my opinion to speak of theories of SLA. Schumann's acculturation model, for example, is insufficiently comprehensive to be labeled a theory. His model is restricted to explaining only naturalistic (i.e., untutored) SLA, and he ignores the cognitive dimension altogether. Furthermore, at this time it is difficult to see how acculturation can be measured, thus hindering attempts to put his central hypothesis to the test.

Krashen's monitor theory is more comprehensive, but it contains

untestable hypotheses (because of the unoperationalizable constructs) and so is "unfalsifiable in its current formulation" (Long 1985, 8). Moreover, what is known about SLA under conditions Krashen describes as propitious for acquisition would seem to argue against the two central points of Krashen's theory as stated earlier. Comprehensible input with a low/weak affective filter is not sufficient for language acquisition "unless one can tolerate sometimes (1) quite limited levels and (2) slow rates of attainment" (Long, forthcoming).

Hatch and Hawkins, and Wong Fillmore and Swain, on the other hand, make no claim that their work has resulted in either type of theory of SLA. What they have been engaged in is model building—identifying the components of the SLA process and beginning to show how they interrelate.

Thus, the state of our knowledge is such that no comprehensive theory yet exists. This is not to deny the value in considering what we do know; in fact, that is precisely the purpose of an information exchange. Nor is it to deny the fact that one day a theory will exist—a modified version of one of the models presented here perhaps or some new formulation. In any event, prior to that time the kind of research and model building, both uni- and multidimensional, described here will do much to contribute to our ultimate success in understanding and explaining second language acquisition.

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A Theory of Strategy-Oriented Language Development

Michael Canale

The term *theory* in my title is not used to refer to an explicit or formal model of language development that might have practical applications. Rather, the term is used to refer to the efforts that a group of learners, teachers, and researchers in Ontario are making in order to understand the key components and value of a variety of activities that we have been jointly exploring in language classrooms at the 7–10 grade levels during the past year. With the general aim of sharing a few elements of our current work and theorizing about the findings, this paper briefly summarizes the project in which we are engaged, our current thinking about problem-posing activities, and our current views on language-use strategies.

Project Overview

Our project, entitled "Problem-Solving Materials for Français and Anglais Classrooms: Language Enrichment Modules," is a two-year curriculum material research and development project funded by the Ontario Ministry of Education. As is perhaps evident from the project title, the group the project seeks to serve is French-speaking students and educators, who represent a minority in Ontario—less than 6 percent of the population. As is also perhaps evident from the project title, the main goal of our work is to provide sets of problem-solving activities to help students enrich their language proficiency in both their native language (French) and second language (English). These activities are intended to provide concrete examples of language curriculum goals and classroom methods compatible with new curriculum guideline documents under preparation by the ministry for both Français and Anglais at the intermediate (grades 7–10) and senior (grades 11–12) levels in Ontario public French language schools. It is worth mentioning here that these guideline documents emphasize language as a tool for thought, a tool for social interaction, and a tool for artistic expression. The guidelines also emphasize integration of receptive and productive skills in authentic and collaborative language-learning and language-use environments.

Our main method for researching and developing activities on the project has been to co-teach and otherwise cooperate with learners and teachers in eight classrooms in the Toronto and Ottawa areas. Two aspects of our method are particularly noteworthy: first, we have been co-teaching with teachers who themselves were identified as exemplary language teachers, i.e. as exceptionally industrious and gifted; second, we have been working with these teachers and their students for six months on the average. We have recorded data created through this method in many ways: our own field notes, teacher and student written logs, and audio and video recordings. Analysis of these data has been and will continue to be carried out in constant collaboration with the learners and teachers who are our co-investigators. Perhaps our most important general finding to date is that both learners and teachers have proven to be receptive to the challenging notion that the role of the teacher is to transfer responsibility for minority culture and language enrichment to the learners themselves.

Problem-Posing Activities

Our general interest in problem-posing (or problem-solving) activities owes much to the cognitive developmental framework articulated by Case and Bereiter (1984). Put briefly, this framework focuses on the representation of problems (or tasks or situations), the representation of solutions to problems, and the actual strategies used both to arrive at these representations and to bridge the gap between a problem and its solution. All of these representations and strategies are viewed developmentally with special emphasis on understanding successful and unsuccessful behavior at each developmental stage.

Our specific interest in problem-posing activities in language development reflects three views on the nature of language learning and language use. First, language learning and use are problem-posing activities by their very nature and hence involve a broad range of strategies (Breen, Candlin, and Waters 1979). Second, in spite of needs analyses and various communicative approaches, learners more often than not face frustrating problems in actual language use. Hence, according to Faerch and Kasper (1983, 31), "instead of basing a syllabus on the rather unrealistic assumption that it should prevent the learner from running into communicative problems, one can adopt an alternative approach which acknowledges the potential problematicity of [target language] communication, and incorporate ways of dealing with such problems into the syllabus." Third, learners may be more resourceful and confident in dealing with such problems in actual language use to the extent that they have already experienced and dealt with them in a supportive learning environment (Rivers 1983).

The problem-posing activities we have been exploring range from brief small-group tasks, to two-week projects involving the creation of interactive adventure stories on microcomputer, to multimonth class drama productions. A concrete example is that of a brief oral interaction activity in which groups of learners are required to find and later remove a treasure hidden on an imaginary farm (Breen and Candlin 1982). The activity is described in the following.

Learners are divided into groups of four such that within each group the students vary in their oral proficiency in the target language. Each group is given a map of the farm and each member of the group is given a different clue (written in the most commonly shared language of the learners other than the target language) about the location of the treasure. All four clues are necessary in order to locate the treasure, and all communication must take place through the target language or gestures. Each group member thus has a specific responsibility, and all must assist one another to achieve a common goal. As a result, learners must negotiate, interpret, express, and assess meanings at cognitive, social, linguistic, and affective levels (i.e., create and use a variety of representations and strategies at each level). Learners' performances may be tracked through audio or video recording and through observation notes taken by other learners or the teacher. Teachers and learners can then analyze the performance; focus attention on problems and strategies, as appropriate; re-do the activity using different clues; design similarly structured activities based on different themes; discuss the strengths and weaknesses of different solutions; and so forth.

A few of the important characteristics of this activity are also key ones in other problem-posing activities we are exploring. Some of these characteristics are as follows:

- *Variable focus.* The activity allows learners and teachers to shift attention to structural, functional, or experiential elements of language development as desired (Allen 1983).
- *Differentiation.* The activity allows for differences in problem type, peer-teaching opportunities, levels of language proficiency, learner interests, and time on task.
- *Support.* The activity encourages learners to support one another and provides supporting material as required.
- *Generation.* The activity invites learners and teachers to create new but related activities by varying such factors as content, structure of the problem, and focus of the activity.

In addition to these features, we have been analyzing activities with respect to the motivation they promote; the variety of language, prob-

lems, and strategies produced; and the naturalness with which various language and other skill areas or cognitive systems are integrated and refined.

Language-Use Strategies

Our current views on language-use strategies owe much to existing work such as that of Bialystok and Ryan (1985) and Faerch and Kasper (1983), among others. Perhaps the two most important aspects of our views follow.

First, we understand language-use strategies to include a broad range of behavior that includes at least the following continuua: verbal to nonverbal, observable to unobservable, successful to unsuccessful, expert to nonexpert, local to global, compensatory to enhancing, learning-related to productive, linguistic to pragmatic, self-directed to other-directed, prefabricated to created, immediate to extended/delayed, and goal-dictated to goal-generating. Clearly these strategies may co-occur in any language use, and more fine-grained distinctions may be made within any of these strategy types.

Second, we view such strategies positively as invaluable aids to language learning and use. This view is at least in partial contrast to the commonly advocated one that strategies are largely compensatory in nature and may cause fossilization or otherwise prevent mastery of various aspects of native-like language proficiency. There are several reasons for our positive view of strategies. For instance, certain strategies are not only natural and necessary but also desirable at different stages and with different focuses within a problem-posing activity. In addition, use of and reflection upon strategies can serve not only to develop more resourceful language learners but also allow assessment and research to take place in an unintrusive manner within the context of classroom activities. Finally, more resourceful and reflective learners may be in a position to accept more responsibility for further learning and assessment; that is, to become more active agents and co-investigators in their own language enrichment and in that of their peers (Scardamalia and Bereiter 1983).

Conclusion

While this brief summary paper has outlined some of our current thinking on the value of problem-posing activities and language-use strategies for language development, it should be emphasized that we view language development, problem-posing activities, and strategies as important for the development of the interactional and critical thinking skills that also play a crucial role in academic achievement. In this respect, we share an interest with researchers such as Cummins (1984) and Wells (1982) in the relationship between language development and academic

success, especially in minority language education.

It should also be emphasized that we are increasingly aware of the numerous and serious limitations of our current thinking. For example, we recognize that some language learning and use may be more problematic than others; consequently, we risk trivializing the notion of problem posing and misrepresenting language learning and use by seeking to understand all language activities and strategies as problem-related. Also, we recognize just how much our own thinking reflects "practice-driven theory" rather than more rigorous and profound theory construction. We accept, for the moment, these and other limitations on our work since we also recognize that the activities we are exploring may or may not be of value for the reason that any theory of language development would be hard put to describe and explain.

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Motivation, Intelligence, and Access: A Theoretical Framework for the Education of Minority Language Students

Edward De Avila

Over the past 15 years our research and experience have suggested three factors as important in understanding individual success in school: (1) interest and motivation; (2) intelligence and experience; and (3) psycho-social access. Our purpose here is not to fully explain all academic performance or school-related behavior but rather to set the stage for a description of our approach to program development and implementation by providing a theoretical framework. We will argue that each of the three factors is critical for a full understanding. However, viewed in isolation each is insufficient either to explain or to predict performance. Academic excellence results from the combination of the three.

Interest and Motivation

There has been a great deal written on academic motivation and interest and the role of personality factors as they affect performance in school. For years it was thought that underachieving students were simply not motivated to achieve. The assumption was that the students were motivated along the same dimensions and that the problem faced by educators was simply a matter of "motivating" underachieving students. In a more recent view, low achieving students (particularly minority language students) have been characterized as having cognitive structures with important gaps in fundamental knowledge. Typically, these students are seen as being handicapped in language development with parents who are poor language models and who do not value or encourage intellectual development. Although many psychological, sociological, and anthropological views have added to our understanding of how cultural and/or personality differences may influence school behavior, these views have also, unfortunately, contributed to ethnic stereotyping by con-

fusing individual with group differences. The most objectionable part of a stereotype is the belief that the stereotype applies to all members of the group and represents inborn unalterable traits.

For a variety of methodological and theoretical reasons, findings from recent investigations have led us to reject virtually all of these conceptualizations. Moreover, on purely practical grounds, explanations based on "poor self-concept" and "low achievement motivation" and the like have done little to improve the design and/or delivery of educational instruction for ethnolinguistically different students. Our research seems to show that although concepts such as self-concept, impulsivity, and other constructs globally defined as *cognitive style* have not been particularly useful at a group level, it does seem reasonable to talk about the characteristics of successful students without reference to possible differences associated with ethnolinguistic group membership.

An experiment using games, described by McClaland, Atkinson, Clark, and Lowell (1953), along with the results from many other studies, have been interpreted as suggesting that while successful behavior is motivated by the wish to win and a corresponding belief in the possibility of winning, a good deal of unsuccessful behavior is motivated by the wish to avoid possible failure. Thus, the unsuccessful student picks tasks or targets which are virtually out of reach or so easy as to be trivial. In either case there is no real challenge or risk. Moreover, there is little in the way of academically valued accomplishment.

Learning implies an element of risk regardless of content. Repeated failure or difficulty in school lowers interest in academic subject matter as well as expectation for future success. Academic performance, however, does not seem to be fully explained by motivational factors alone. Simply wanting to achieve does not guarantee success. Motivation is a necessary prerequisite, but it is not sufficient.

Program design. In our attempt to develop viable programs for minority language students we began by asking, what kinds of things do children between the ages of 3 and 12 like to do? Similarly, what kinds of things found in the popular culture carry an educational value across different developmental and interest levels? Consider interest first. The research on children's interests is fairly clear. Children like to do things that help them gain a sense of mastery over their environment. About 25 years ago Robert White (1959) called this intrinsic need *effectance.* Human beings spend the major portion of their youth attempting to learn how to be effective. The role of education, whether it be in the home or the school, is one of assisting in the process.

Children also like to do the things their parents value. The extent to which parents value a given behavior or attitude is indicated to the child by the extent to which parents engage in it. Our search for an approach to facilitate the development of effective children in both home and school

leads to the more general question of what kinds of things are of value to parents and of interest to children regardless of linguistic, cultural, and geographic differences.

The above consideration has led us to conclude that some of the most universally held interests are to be found in the areas of science and mathematics. In this sense probably all children have wondered about where the sun goes on a rainy day or why things always fall down. Not only do science and math offer educationally meaningful content, they offer a perfect context in which to facilitate the development of higher order thinking skills.

Intelligence and Development

Intelligence is typically thought of as a score on an intelligence test. It is often expressed in terms of an I.Q. score. In the past, this number or I.Q. value was thought to be indicative of the raw or innate, and thus fixed, capacity of a person to achieve. Over the years correlational studies were used to show that I.Q. was a useful concept in predicting academic success and a handy device for explaining the low academic performance of a good many students, particularly minority students.

More recent research and theorizing have suggested that not only is the concept of fixed intelligence, defined as I.Q., socially egregious, but that intelligence tests measure a good deal more than simple innate capacity. In fact, the I.Q. controversy has led some to conclude that the concept is of little value. Nevertheless, research has clearly shown that there are individual differences between students, and it would make little sense to try to teach subjects to children who are neither developmentally ready nor intellectually able to learn them.

In an attempt to take advantage of what is known about how children mature intellectually, we have taken an approach that borrows from recent work in cognitive psychology, particularly information processing theory. By integrating this work with some of Piaget's developmental notions, we arrive at a definition of intelligence that is particularly well suited to handle the social, psychological, linguistic, and educational diversity.

We define intelligence as *what children can do with what they know.* Defined in this way there are two aspects that are important in determining a child's level of intellectual development. The first is what a child *knows* and brings to the educational setting, and the second is what the child *can do* with this knowledge. In a limited sense, intelligent behavior results from the interaction of the child's repertoire and capacity.

By *repertoire* we refer to all of those things a child brings to the educational setting. This includes his or her language and culture, an understanding of the social demands of the classroom and/or test situation, as

well as a host of other skills typically associated with family background. Children's repertoires are thus the machinery that runs their intellectual mills. Children with a very rich or elaborate repertoire are not necessarily more intelligent but are simply in a better position to behave intelligently simply because they have a greater number of strategies (intellectual as well as social) with which to approach a task. If, for example, a child comes from a home where English is not spoken, there is a good chance that the child has not learned sufficient English to deal with much of the test's content. As a consequence, it is virtually impossible to tell if the child has missed a test question because the child does not know or understand the concept or because the student does not possess sufficient skill to either understand the instructions or complete the task. Ostensibly, our position is that one of the major purposes of education is to facilitate the development of generalizable strategies which will serve the student regardless of background characteristics.

Appreciation of the fact that children come from diverse backgrounds leads to a recognition of the problem that children from different environments cannot be compared since they possess different repertoires. If intelligence is what children can do with what they know, and if children come from different and sometimes radically diverse backgrounds, then how is comparison across children possible? In a series of experiments conducted over the past fifteen years in Canada, Mexico, and the United States, we have found that when the effects of prior experience (i.e., repertoire) are controlled through the use of pretraining procedures, many of the differences between ethnolinguistic groups in intellectual ability seem to disappear. In other words, ethnolinguistic group differences in intellectual ability reported in the literature are largely a function of *repertoire differences and not intelligence per se* (De Avila 1976; De Avila and Duncan 1980).

Consideration of the differences between repertoire and capacity leads to an understanding of the important distinction between intellectual ability and school achievement. The poor academic showing of many minority language and other students, coupled with the results of the above studies, gives testimony to the fact that while intelligence is a necessary condition for achievement, it alone cannot be considered as sufficient.

Program design. Our overriding purpose is to design programs that facilitate cognitive functioning and thereby improve academic performance. In other words, our purpose is to facilitate the development or acquisition of intellectual strategies (i.e., increase the repertoire) that have applicability in a variety of educational and other contexts. We approach this task by taking children's natural interest in how the world works and focusing on mathematical and scientific processes. In so doing we consider the difference between the facts, labels, and names encountered in

science and the concepts and intellectual processes underlying them or their use. In this sense we would distinguish between the word and its meaning, or between the label for an object and its function; labels vary, functions do not.

In the following discussion, contrasts and comparisons are made between two types of learning, both of which are necessary in the educational process. The first type of learning involves primarily memory work, as is involved in learning a list of words. The best way to learn in this way is through repetition, drill, and practice; there is simply no other efficient way. The second type of learning, concept learning, exhibits an important difference and is best understood through a description of a concept formation task. Historically, concept formation has been studied in the laboratory since the nineteenth century under various names, including insight, inference, and problem solving. From our point of view the important thing to remember is that the common element of these tasks is that they all demonstrate the principles of how thinking skills are developed.

We use Harlow's (1949) concept of the learning set to explain the process of forming or acquiring a thinking skill. In a typical learning set experiment, (called an oddity problem), the child is presented with a set of objects (e.g., three red wooden shapes, two of which are rectangular and one triangular). The child is asked to identify the one that is different and is rewarded if she or he makes the correct identification. If the child fails to make the correct identification, the shapes are simply removed and presented again in a different configuration. In the process of repetition each presentation differs slightly from the former along some irrelevant dimension. In a memorization task, on the other hand, the child simply keeps repeating the same thing over and over. In forming a concept, thinking skill, or learning set, reach repetition involves some slight difference. During the process of repetition the children come to form a concept that enables them to distinguish the relevant from the irrelevant features of the situation or stimulus, because the concept remains invariant.

What researchers have found is that concepts that are formed in this manner are highly stable across time and situations. In other words, once a concept is learned, the student attempts to use the concept to solve other problems which, from the student's point of view, appear to be similar. Thus the concept becomes a strategy for dealing with new situations.

A dramatic example of real-life learning-set formation is offered by Hunt (1961) in his description of Helen Keller. Both blind and deaf since her first year of life, Helen did not hit upon the generalization that "things have names" until the critical water-pump incident in her eighth year. There are several aspects of Helen's insight or discovery which have a

bearing on our approach. First, it is important to note that Helen's understanding of the idea that "things have names" did not occur in an incremental fashion. While there were numerous exposures to the concept, her insight took place all at once. What this means at the practical level is that we can never tell exactly when the insight will take place or exactly what kind of task will trigger it. To allow for such insights, our approach embeds concepts in interesting tasks that vary along "irrelevant dimensions" while the principle of solution remains invariant. Second, by virtue of our approach to concept repetition, differences between students become an asset to instruction as opposed to a hindrance. Exposure to varying points of view is just like a learning-set task or experiment. In this case, language can become an irrelevant dimension, and the need to discuss task demands in different languages inevitably leads to a focus on deeper meaning as opposed to labels, since labels differ between languages whereas concepts in science and math do not. Third, Helen's insight was driven by a need to communicate. Similarly, children's learning is usually pragmatic. They learn the things they want to learn in order to accomplish some end.

This distinction between means and ends is often confused in the educational process, particularly in compensatory approaches to remediation of basic skills where skills development becomes an end in itself. Children find themselves filling out endless dittos with little understanding of why. In minority language programs where the avowed purpose is to teach English, non-English-speaking students learn endless lists of isolated words for no apparent purpose other than to satisfy the teacher. The result is inevitable—students learn rote skills such as those found in decoding or computation with little real understanding as to how to apply them as a strategy for learning.

In our program basic skills development is one of our primary objectives; however, the acquisition process always takes place in the context of science and math tasks. In this way we introduce various aspects of language, reading, and arithmetic from within the tasks themselves. The skills are never introduced in isolation or out of the context in which they serve an explicit purpose. In this way children come to appreciate their means-ends relation; they learn to read, measure, calculate, record, estimate, and write so that they can do interesting things.

Fourth and finally, one of the most compelling aspects of Helen Keller's education was the extent of her effort. Her discovery at the water pump involved intellect and body alike and clearly illustrates the importance of the relation between learning and motoric involvement (muscle tension), a relationship clearly demonstrated by Held and Hein (1963), among others. Motor involvement is facilitated in our program by using tasks requiring manipulation of concrete objects, thus promoting active, not

passive, learning. This use of concrete objects also facilitates cross-model multiple presentation which is consonant with learning-set methodology.

Access

Educational access is associated with the concept of educational equity. In fact, it is embedded in the very definition of educational equity as described in the Civil Rights Act of 1964 which guarantees "equal access to educational opportunity." The assumption has generally been made that access and opportunity are synonymous as long as students are instructed at the same location (ideally, in integrated classrooms). More recent discussion by De Avila and De Los Santos (1979), however, has suggested that in the education of minority language populations one must rethink the concept of educational equity insofar as one must consider not only *where* students receive instruction, but *how* the instruction is delivered and received.

Access, as we view the term, can be discussed in several ways, including from linguistic, psychological, and sociological perspectives. At the most general level, access can be thought of in terms of socioeconomic status (SES). In other words, by the simple fact of coming from a family of high SES, some children are exposed to educational and quasi-educational experiences that have a beneficial impact on education and intellectual performance.

To fully understand our approach to the concept of access as it applies to the psychological aspects of educational performance, it is important to bear in mind that at the classroom level there is a difference between learning or memorizing a list of names or numerical equivalences and forming concepts about previously unknown relationships. Our position is that compensatory programs have tended to emphasize the former at the expense of the latter, and that this emphasis constitutes a denial of access. The assumptions underlying this tendency are that deficiencies must first be remediated and that children need to know their facts before taking on more abstract material. These assumptions are particularly evident in the case of minority language students where proficiency in English is used as a prerequisite to participation in classes involving more complex material. The inevitable result is continued failure since programs emphasizing rote skills tend neither to be at levels commensurate with student's levels of development nor to be interesting in a personal sense.

Our thesis is not that memory work is unimportant but that all content cannot be taught in the same way, since it is not all acquired by the same processes. There is only one way to learn the names of the states; they must be memorized. Thus, memorization has its place. However, more conceptually based learning requires a different approach, one that is not particularly amenable to whole class instruction dominated by lectures or

situations emphasizing individualized seat work. Such models only further the isolation of lower achieving students.

Another type of access has to do with the student's ability to communicate in the classroom. To the extent that the student is unable to participate in oral discussion or interchange, the student is denied access, regardless of the presumption of full opportunity.

Related to this, we have found that one of the strongest predictors of academic growth or conceptual learning (as distinct from memory work) is the amount of time students spend talking and working together. The problem is that in a heterogeneous classroom centered on the teacher, there is little chance for student-student or student-teacher dialogue, especially if the teacher does not speak the child's language. Moreover, if oral English proficiency is viewed as a dimension of social status, which is more than likely the case in a linguistically heterogeneous class dominated by native English speakers, the limited- or non-English-proficient student is relegated to a lower social status within the classroom. The net result is a lowered frequency of verbal interaction, a further distancing between the limited speaker and the rest of the students, and a presumption of lower general or overall ability in the limited-English-proficient speakers.

Work by Cohen (1974) and her colleagues at Stanford on status relations between groups in the schools and on teacher expectations has shown that regardless of high intellectual capacity and motivation to do well in school, not all students have the same chances for success. Based on the theory of status characteristics and expectation states, Cohen has found that the expectations of nonminority students and teachers produce a strong self-fulfilling prophecy for failure on the part of minority language students. Moreover, Cohen has found that low achieving minority language students come to share low expectations for success with other more successful students. In other words, low achieving students become the unwitting "co-conspirators" of the self-fulfilling prophecy for failure.

Cohen's analyses, however, do not imply that children hold an overriding low self-concept. One simply has to observe the behavior of minority language students on the school playground or in the home to understand the limited nature of the concept. Cohen points out that even though teachers are able to identify the symptoms of the low self-concept child, they fail to recognize the behavior as a reaction to the expectations. Finally, Ogbu (1974) has noted that achievement motivations of minority students are much more dependent on their perceptions of the actual distribution of opportunities than upon either personality characteristics or training in the family per se.

Program design. We begin our description of how issues of access can be resolved by asking several questions. For example, what are the necessary organizational conditions for providing effective instruction in

academically, linguistically, and socially heterogeneous groups? What are the necessary roles and responsibilities underlying effective classroom organization? What kinds of classroom organizations are conducive to learning-set or concept formation? How does memory work fit in? What is the teacher's role in this kind of environment? Answers to these questions require the formulation of a complex model that is based on the cooperation of all involved, where rights, responsibilities, and roles are well delineated and tasks are orchestrated in a manner consistent with these three factors.

One of the clearest conclusions that can be drawn from the need to consider differences across students is a need for complex models of instruction. There is simply no way an individual teacher can address all of the diversity brought to the classroom by students who differ along the dimensions described above and move all these students in the same direction, without a high level of organizational skill. Organizational sociology has demonstrated that complex tasks require a high degree of cooperative group work. Cooperative group work in the classroom consists of students working together as equals, in groups small enough to accommodate the full participation of all of its members. Group and individual responsibilities are clearly understood, and students carry on their tasks without direct or immediate teacher supervision. Several immediate implications can be drawn from this definition.

Before students actually begin a program such as ours, they must first acquire the ability to work together cooperatively. In learning how to work cooperatively, students acquire a number of presocial skills that apply to almost any group task. For example, pretraining in group work leads to the ability to ask questions and help others, as well as to listen and assume responsibility for one's own behavior. Group work also requires a delegation of authority in order to be maximally effective. To some extent, delegation of authority means that students take responsibility for their own learning. The teacher's role is to focus attention on the relevant aspects of the task by asking appropriate questions without directly instructing. The teacher serves as a manager, facilitator, and resource; the students are responsible for the completion of tasks.

Students are ultimately responsible in the learning process. If they are to succeed in this connection, they must have a clear understanding of their rights, responsibilities, and roles—the three *R*s—which constitute the norms of our program (or any other program for that matter). By norms we mean rules used to govern behavior. A norm is a rule for how one ought to behave. Once learned or internalized, norms become powerful organizers in any social situation and can eliminate the need for direct discipline or direction and free the teacher to be involved in more important matters.

By far the strongest normative rule underlying the social fabric of our approach is found in the student's right to ask for help. This right does not mean, however, that students can go running to the teacher or aide at the first notice of a problem. Rather, there are channels of communication to ensure that the student's questions do not go unanswered. With rights go responsibilities. Thus, in the same way as students have the right to ask for help, they have the responsibility to help others when asked. In this way students become resources for one another in fulfilling their individual and joint needs. Roles are assigned to students as a means to make group work more efficient, to reinforce cooperative behavior, to clarify and define working relationships, and to overcome potential status distinctions. However, unlike roles in most organizations, roles in our program constantly change. All students, regardless of background, are expected to meet all of the responsibilities defining the role.

Implicit in our approach is the notion of equal status participation, and several steps are taken to ensure that status differences do not emerge. We go to great lengths to point out that everybody has something to contribute; the tasks are simply too complicated and difficult for any one person to do them all by themselves. Moreover, for a program to be successful, teachers and aides must work together in much the same way as students, as a team—the simultaneous operation of multiple learning centers is more than an individual teacher can handle.

Two aspects of the relationship between teacher and aide are critical. The first and most important aspect is the delegation of responsibility; the second has to do with the idea of feedback. Successful delegation of responsibility allows teachers to spend more time working directly with students. Mutual feedback on observed student behaviors, such as the time students spend on and off task and the amount of time spent talking and working together, and so on, allow the teacher and aide to better evaluate student progress and general classroom operations. (We use an observation form explicitly for this purpose.) The establishment of a collegial relationship between teacher and aide is essential.

In brief, the role of the teacher in our program is to facilitate the development of learning sets, and the primary responsibility of both teacher and aide is to focus the student's perceptual apparatus on the essential features of the task. This is best accomplished by asking constructive questions and providing quick feedback. The best teacher is the one who never gives the answer but always has another question. In this way the teacher guides the learning process in an unobtrusive manner. The teacher is the child's access to knowledge.

In the above, we have reviewed several issues which are important to the design and implementation of successful educational programs for minority language students. It should be readily apparent that although we have discussed interest/motivation, intelligence, and access separate-

ly, the three are inextricably bound. A student may have the needed intelligence and interest, as do many minority language students, but may lack access and thus be unsuccessful in school. Another student may be highly intelligent and have access to beneficial educational experiences, and yet do poorly in school because of lack of interest. While the three factors can be distinguished for purposes of discussion, they cannot be separated in designing or delivering successful programs.

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Second Language Learning in Children: A Proposed Model

Lily Wong Fillmore

In this paper I discuss a view of language learning that has evolved over a decade of research on the learning of English by children for whom English is a second language. My goals in these studies have been to understand the nature of the process and to discover what causes the variation that exists among learners in respect to the ease with which they learn the new language. I have been particularly interested in the interplay of cognitive and social factors with situational and linguistic factors in the settings in which learning takes place. In all, I have studied the development of English in well over 200 five- to eleven-year-old children, some of them for as long as three years.

A couple of years ago Merrill Swain and I (Wong Fillmore and Swain 1984) decided to put what she and her colleagues had been learning in their studies of second language learning in Canada together with what I and other American researchers had learned in studies of children over the previous decade. In the end we arrived at a fairly satisfying formulation of what is involved in second language learning. It is Merrill's and my attempt to integrate what we know about second language learning into a model that can be tested. The model identifies the critical components and processes in language acquisition; it allows us to account for age differences and individual differences; it suggests ways in which second language learning may differ from first language learning; it helps explain why it is that in some situations people fail to learn a second language altogether.

The model is a complex one and is difficult to talk about in purely abstract terms. It is easier to show how its pieces fit together through discussions of situations that are familiar to all of us. Typically, second language learners in this society are members of immigrant families. The family speaks a language other than English and continues to use it in the home and in the immigrant community. At the same time, the family members have a genuine need to learn English and are motivated to do so because it offers them access to the social and economic life of the community they are joining. Nonetheless, learning this new language is

an enormously complex task consisting of figuring out and learning the full system of linguistic, social, and pragmatic rules that govern the language behavior of the speech community.

Despite the complexity of the task most individuals are up to it. People, no matter what their background, do not come to the task of learning a second language empty-handed; they are guided by a prior social, linguistic, and general world knowledge. Because they already know one language, they know what sorts of things people talk about. They have a fairly good idea of what they will have to learn to do and say in English. The immigrant family is in a perfect situation for language learning since it is living in a society that provides generous exposure to those who speak the language natively; the speech behavior of these people will allow the learners to figure out how the language works.

The language learning situation I have just outlined comprises the necessary ingredients for second language learning. There are three major components: (1) *learners* who realize that they need to learn the target language (TL) and are motivated to do so; (2) *speakers of the target language* who know it well enough to provide the learners with access to the language and the help the learners need for learning it; and (3) a *social setting* that brings learners and TL speakers into frequent enough contact to make language learning possible. All three components are necessary. If any of them is dysfunctional, language learning will be difficult, or impossible. When all three are ideal, language learning is assured. Each of them can vary in a great many ways, however, and some of this variance can critically affect the processes by which language is learned. These then are the three essential components of the model.

Language Learning Processes

Three types of processes come into play in language learning, each of them intricately connected with the others. These can be described as (1) social, (2) linguistic, and (3) cognitive. I will discuss each in turn.

Social processes. By social processes I have in mind the steps by which learners and TL speakers create a social setting in which communication by means of the target language is possible and desired. Social processes figure in language learning in the following way. Regular social contacts with people who speak the TL allow the learners to observe the language as it is used by TL speakers in natural communication while providing an incentive for learning. In the course of these contacts, learners have to make the speakers aware of their special linguistic needs and get the speakers to make whatever accommodations and adjustments are necessary for successful communication—a difficult task. In interactions in which the TL is used, the learners have to participate at some level, since the quality of their participation plays a crucial role in getting

speakers to use the language in the special ways that make the speech samples from these contacts usable as language learning data. When TL speakers and learners interact, both sides have to cooperate for communication to take place. The learners make use of their social knowledge to figure out what people might be saying, given the social situation. The learners assume that the speech used by the speakers is relevant to the immediate situation; if the TL speakers are being cooperative, this will indeed be true. Those situations that promote frequent contacts are the best, especially if the contacts last long enough to give learners ample opportunity to observe people using the language for a variety of communicative purposes. Those which also permit learners to engage in the frequent use of the language with speakers are even better.

Linguistic processes. By linguistic processes I have in mind the ways in which assumptions held by the speakers of the target language cause the speakers to select, modify, and support the linguistic data that get produced for the sake of the learners. On the learners' side there are assumptions about the way language works that cause the learners to interpret the linguistic data they have to work with. Linguistic processes figure in language acquisition in several crucial ways. The first way intersects with the social processes I have just described, and in a sense, involves linguistic processes principally when looked at from the perspective of the speakers of the target language as they interact with the learners. Basically, what learners have to get out of these contacts is linguistic knowledge—the phonological, lexical, grammatical, pragmatic, and sociolinguistic knowledge that eventually allows learners to speak and comprehend the new language in a full range of social and communicative situations. What it takes to acquire this kind of knowledge is exposure to linguistic data in the form of situationally anchored speech produced by speakers of the language in the context of social interaction that involves the learners in one way or another. These linguistic data, together with the supporting social context in which the data are anchored, constitute what researchers studying first and second language acquisition refer to as *input*—the materials on which learners can base their acquisition of the language.

Language produced by speakers in social contacts with learners can serve as input when the speech has been produced with the learners' special needs in mind. It is not ordinary language, but language which has been selected for content and modified in form and presentation. It tends to be structurally simpler, more redundant and repetitive, and as Michael Long (1981) has suggested, it is characterized by greater structural regularity than is found in ordinary usage. The modifications that speakers make in this kind of language are based partly on notions about what nonproficient speakers would find difficult to understand and what they would find easy. Studies of the phenomenon of "foreign talk" in-

dicate that modifications made by speakers on the basis of *a priori* beliefs about the relative difficulty of linguistic forms are not always helpful to learners, and can, in fact, mislead the learners as to what the target forms are like. More useful accommodations are based on actual feedback provided by the learners as to whether or not they understand what is being said to them.

This leads to the second way in which linguistic processes appear to figure in language acquisition, a way that intersects with cognitive processes. Looked at from the learners' perspective, the basic problem for the learner is to make sense of what people might be saying given the social situation at hand. This might seem like an impossible task, but second language learners have some special resources available to help them in this process. Because learners already have a language, they know about such linguistic categories as lexical item, clause, and phrase. This awareness of grammatical form and structure will predispose them to look for equivalent properties in the new language data.

Similarly, through the experiences they have had in their first language, learners are generally knowledgeable about the speech acts and functions that can be performed linguistically. They know about the uses of declarative and interrogative structures, about affirmation and negation, about expressions of certainty and uncertainty in speech, and the like. This kind of prior linguistic knowledge and experience will lead second language learners to seek and to discover means for accomplishing the same functions in the new language. The assumption that forms will be found in the L_2 that are functionally equivalent to L_1 forms can lead learners to acquire the forms more efficiently than they might otherwise. At the same time, however, it could interfere with learning, since this assumption sometimes leads learners to draw largely unwarranted conclusions that L_2 forms are functionally and structurally *identical* to L_1 forms and usages. Nevertheless, the net result is positive. By applying the knowledge they have of what people are likely to say in various social situations to what they know are possible forms, patterns, and functions in language, learners are more or less able to give meaningful interpretations to the language they hear, and thus, to discover eventually the principles that govern the structure and use of the language itself.

Cognitive processes. The third type of process in language learning includes those that can be described as cognitive. In a sense the cognitive processes in acquisition are the central ones. These involve the analytical procedures and operations that take place in the heads of learners and ultimately result in the acquisition of the language. Let us consider what the cognitive task involves. The primary linguistic data that learners have available to them as input for their analyses consist of speech samples produced by speakers of the target language during social contacts in

which the learners are themselves participants, as I have argued. What learners must do with these data is discover the system of rules the speakers of the language are following, synthesize this knowledge into a grammar, and then make it their own by internalizing it. That in capsule form is what the cognitive task is for any language learner.

Figuring out how the speakers of the target language are using the noises they produce to represent meaning is the first step. This involves discovering how the speech serving as input segments; that is, figuring out where one thing ends and another begins is critical to the procedure. Once the learners know what the units are, they can figure out how the segments are used to represent meanings, how such units can be assembled structurally to communicate more complex ideas and thoughts, and finally, what principles the speakers of the language use to achieve their communicative goals and intentions. Learners apply a host of cognitive strategies and skills to deal with the task at hand: they have to make use of associative skills, memory, social knowledge, and inferential skills in trying to figure out what people are talking about. They use whatever analytical skills they have to figure out relationships between forms, functions, and meanings. They have to make use of memory, pattern recognition, induction, categorization, generalization, inference, and the like to figure out the structural principles by which the forms of the language can be combined and meanings modified by changes and deletions.

Such cognitive tools can be described as general cognitive mechanisms. Some second language researchers would object to this claim. According to the prevailing linguistic theory, a special cognitive mechanism is responsible for language acquisition. This mechanism, which is referred to as the language acquisition device (LAD), is said to operate in a quite different way from ordinary cognitive processes. One of the major arguments for the cognitive processes involved in acquisition being special ones is that many of the features of the grammar that learners eventually acquire cannot simply be induced from the linguistic data that are available to them. By this view of acquisition, what I have described as social and linguistic processes are regarded as incidental or peripheral phenomena. If they figure at all, they play only trivial roles; everything that is really important in language learning has to do with the working of LAD. Adherents of the LAD proposal have argued that no matter what other kind of information or help is available to learners, the primary data learners have to work with are samples of speech consisting of phonological signals that are not cognitively penetrable; that is, they are not tractable to the ordinary manipulations or analytical procedures available to the children. The only explanation for language acquisition acceptable to people who hold this view is that language rules are somehow innately available to the acquisition device in some abstract

sense. To trigger the discovery of these rules, the device only requires exposure to data in which language rules figure.

That may be the case in first language learning. Nearly everyone does in fact end up learning a first language, despite huge differences in general intellectual endowment and early language experiences—no matter how difficult or complex the target language. This does not seem to be the case in languages other than the first, in which great differences can be found in language learning ability across individuals. What I believe to be the case is this: language learning involves two kinds of cognitive processes, both those which are specialized for language learning (i.e., of the LAD type) and those which are involved in more general intellectual functioning. In first language learning, mechanisms of the first type figure more heavily than those of the second type. In fact, the cognitive skills of the second type are just developing while children are acquiring their first languages.

By the time individuals are likely to find themselves learning a second language, however, such general cognitive skills are well developed. They figure in whatever cognitive tasks an individual encounters, including those involved in learning a new language. The LAD type mechanism that participates in first language learning may also play a role in second language learning. In fact, I would argue that both types of cognitive mechanisms are involved in language learning, whether the learner is dealing with a first or a second language. The degree of involvement of these two types of mechanisms is *reversed,* however, for second language learning. While specialized language learning mechanisms figure in an important way too, general cognitive mechanisms are more heavily involved. This, in fact, may be a crucial difference between first and second language learning.

There are two kinds of evidence for this conclusion. One consists of observations of strategies that children appear to follow when they tackle a second language. The other relates to observations of individual variation in the learning of second languages. The cognitive strategies and skills that I have described in this paper involve the use of general cognitive mechanisms rather than specialized ones. The cognitive work learners engage in results in figuring out and acquiring rules, principles, and patterns, yet such materials do not necessarily add up to a grammar. At some point, the knowledge that has been gained through the workings of general cognitive mechanisms needs to be consolidated and assembled, in a manner of speaking, into a competence grammar. This, I would argue, is where the language-specific cognitive mechanisms, or LAD, come into play; through these processes what the learner has sorted out becomes synthesized into a real competence grammar, and perhaps many of the details of the grammar get refined here as well. This last part, I admit, is speculative; there is no way of proving or disproving it.

Variation in Components

These then are the processes that figure in language learning. We can now consider how they work, or do not work, in relation to variation in the three components that were described earlier: the learner, the speakers of the target language, and the social setting. Let us return to the example of children of immigrant families. These children come into contact with speakers of the TL in school, which is the best possible social setting for language learning.

In such a setting the social conditions for language learning outlined earlier are easily met. The learners are in constant social contact with speakers of the target language. The speakers (the teacher especially, but classmates as well) have ample reason to speak to the learners in this setting, and the classmates are generally inclined to do so in a manner that takes into account the fact that the learners do not know the language. Through observation the learners must then learn *how to do what the speakers can do* by making use of the general cognitive strategies and the social and linguistic knowledge at their command.

This is easy enough for some learners, but not for all. Let us consider the question of variation in second language learning, since this is what leads me to argue that general rather than specialized cognitive processes are most heavily involved in second language learning and that social and linguistic processes play the roles I have described. One of the most striking points is the relatively minor variation we find among first language learners compared to what is seen in second language acquisition, even among relatively young children. Differences of up to five years can be found in the time children take to get a working command of a new language. Learners differ enormously in how easily and completely they master the grammatical details and intricacies of a second language.

I believe that a substantial portion of this variation is due precisely to the involvement of cognitive mechanisms of the kind that have been identified here as figuring most in second language learning. Individuals apparently do not vary in having an innate capacity to learn a language. If this mechanism is as heavily involved in the learning of second language as it is in first languages, then we would not expect to find any more variation in second language learning then we do in first language learning. But, as I have tried to show, the kind of cognitive processes that are most critical in second language learning are the ones that relate to general cognitive abilities. We know that there are considerable differences across individuals in their endowments of these abilities. I am not necessarily referring here to all those abilities that constitute general intelligence, but rather to those that figure especially in language learning: verbal memory, auditory perception, pattern recognition, categorization, and so forth. Some of them—for example, generalization and

association—are obviously associated with those abilities that are directly related to general intelligence, but most of the ones I mentioned are only incidentally related. The point to be made here is that much of the variability found in second language learning can be traced to differences found among learners in the application of these general mechanisms and abilities. Learners who have poor auditory memory will have a difficult time remembering the things they hear in a new language. If they cannot remember what they hear, they will not find it easy to figure things out or to use them. Those who are poor in auditory perception will have difficulty discriminating between the sounds of the new language, and hence will be poor in making sense of what they hear and at reproducing anything. Learners who are poor in pattern recognition will have a difficult time seeing the patterns they must eventually discover in the new language. Moreover, it should be noted that variation in language learning along the cognitive dimension is not just related to differences in learner endowments of cognitive abilities. These differences are also affected by other learner variables.

Age is an obvious one. Recent research has shown that older learners may be relatively better and quicker at learning certain aspects of second languages than younger learners. Research seems to indicate that older learners are better because they have better developed learning strategies and cognitive abilities; yet the cognitive advantages that come with age and experience may not always result in better language learning for older learners. Personality is another type of variable that can interact with age and with cognitive factors to influence language learning. Personal characteristics that may not interfere with language learning in young children can become major problems later in life. One personality characteristic in particular that can increase with age is mental rigidity, a trait which varies considerably from person to person. The unwillingness or inability to accommodate new information or the unknown can make it extremely difficult for learners to handle many aspects of the learning task we have outlined.

Another personality or cognitive style characteristic that can greatly affect language learning, and that varies greatly from learner to learner, has to do with risk taking. Some learners find it difficult to act upon the things they have learned through guessing and may be unwilling to do much guessing at all. They are either afraid of being wrong or of appearing foolish, or they are unable to draw generalizations from the relationships they do see and to test them out.

Observations of variation in learners also provide evidence of the way other types of processes figure in acquisition. In fact, this is what convinces us that social and linguistic processes are also crucially involved in second language acquisition. Consider the effects of differences in the social situations in which learners are to acquire the new language. Social

settings can differ in how much or what type of contact with speakers is provided and hence, how much opportunity learners find to learn the language. For example, some settings provide learners with few opportunities to get close enough to speakers of the language to do any good, or the kinds of contacts the learners get are inadequate for language learning purposes.

Situations for language learning can also differ considerably in the extent to which learners themselves have to play a role in getting the kind of social contact needed for language learning and in the role actual interaction between speakers and learners plays. It has long been assumed that direct interaction between learners and speakers is necessary in order for language learning to take place. But in our research in classrooms, we have found that some learners can in fact pick up a language essentially by observing their teachers and peers with very little direct interaction, while in other situations this is not possible. Is interaction necessary?

What is essential is that learners have access to language that is appropriately modified for them and is used in ways that allow learners to discover its formal and pragmatic properties. There are classrooms, for example, where the English used by teachers for group instruction works so well as input that all of the language learners in the class profit from the experience, irrespective of the students' social inclination. This seems to work well enough, provided the learners are highly motivated and are attentive enough to learn by observation. In classrooms where the English used by the teacher does not work as input or in more unstructured situations, as in "open classrooms,"or on the playground where students cannot count on getting the free input provided by teachers in some classrooms, then interaction between learners and TL speakers is all important. Learners play a much greater role in getting the input they need for language learning.

In such situations, learner variables such as personality and social skills can play a substantial role in language learning. Those learners who find it easy or desirable to interact with speakers of the target language will get a lot more of the social contacts that are needed for language learning than do those who are not as interested or motivated or are less able to manage the kinds of social contacts that are needed for language learning. Variables such as personality, social style, social competence, motivation, and attitudes in both learners and speakers of the target language can also affect language learning.

What I have tried to show in this paper is how the parts of the model that has been proposed figure in the process of language learning, and how variation in the three components can crucially affect the outcome of the process. The model that has been discussed here is just a proposal,

however. We continue to work on it and to test it as we deal with the language learning data that we have collected over the years.

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Implications for Students

Introduction

While a theory of second language acquisition can be intellectually satisfying in its own right, providing insight into an important and often problematic human phenomenon, the primary concern of educators is the implications of such a theory for improved student learning. The four papers in this section illuminate some of the complex connections between academic development and second language development as they are manifested in U.S. schools and discuss issues of relevance to both curriculum planning and evaluation.

Hakuta's paper highlights his research into the relationship between bilingualism and intelligence measures, as exhibited by Puerto Rican elementary school students in Connecticut. This research extends previous Canadian studies to the U.S. context and makes a number of modifications in the research paradigm employed by most Canadian researchers. O'Malley discusses the applicability of learning strategies to the study of both academic content and a second language and concludes with a description of procedures by which second language learning can be combined with modified content instruction through the integration of learning strategies. Chamot focuses on teaching a second language through a curriculum of modified subject matter content and provides options for teaching minority language students of different grade levels and educational backgrounds. In his paper, Gold points out the drawbacks of applying competency tests designed for mainstream students to minority language students. He does so through an analysis of specific factors that have an impact on competency test validity and on the academic advancement of the minority language student.

A focus on the relationship between cognitive development and language development, or between academic development and language development, is one of the principal commonalities of the four papers. In his examination of bilingualism in minority language students, Hakuta found that the degree of bilingualism was positively correlated with measures of general intellectual ability. One of the implications is that a significant relationship exists between the cognitive abilities that enhance bilingualism and the cognitive skills measured by intelligence tests. O'Malley finds that a relationship exists between the learning processes successful students employ in learning content material and those they employ in learning a second language. The active cognitive involvement

of the student is thus seen as beneficial to the language learning process. The use of learning strategies in a content-based approach to second language instruction can therefore enhance both a student's content knowledge and English language ability.

Chamot draws a link between cognitive/academic and language development, espousing a cognitive approach to content-based second language teaching. In such an approach minority language students make use of previous knowledge as well as their information processing abilities. The emphasis is on developing those English language skills that a student will need to successfully participate in the mainstream curriculum. Since content instruction is the medium through which students learn English, students can also develop academic skills appropriate to their grade level.

In his look at competency testing, Gold argues that the academic development of minority language students can be impaired if the results of competency tests are used as a criterion for grade advancement or for the provision of remediation. Gold points out that competency tests administered to minority language students in English are often a measure of language skills and not academic skills. According to Gold, the need to demonstrate skills solely through English might lead to a widening of the achievement gap between minority and majority language students.

The theoretical perspectives and research results contained in these four papers have important implications for the teaching and evaluation of minority language students. If bilingualism does in fact have a positive effect on general cognitive ability, as Hakuta claims, then education in two languages might produce enhanced cognitive achievement as a by-product. Hakuta does not feel bilingual education programs should be instituted solely for this reason, yet if bilingualism is deemed desirable on other grounds, then enhanced cognitive achievement would be a welcome bonus. Hakuta's finding that a strong base in the native language correlates highly with a strong competence in English implies that one language might be used as a foundation for the other.

O'Malley and Chamot's recommendations for a content-based approach to language learning have several implications for the classroom. The two findings that (1) the learning strategies of successful content learners and second language learners are similar and that (2) these strategies can be taught suggest that a conscious effort to promote the use of learning strategies in class can improve the acquisition of skills in all areas. Options for a content-based approach as described by Chamot would lead to a number of options for English language development programs. Chamot outlines an existing program in which content-specific ESL instruction and sheltered English courses are used in a sequenced approach that results in successful mainstreaming.

Gold's analysis of the merits of competency testing for minority lan-

guage students leads him to a number of practical recommendations. These include, among others, the development of competency tests in the student's native language and the avoidance of grade retention if students have mastered grade-level skills only in the native language, and not yet in English.

In summing up the implications of theory for the instruction of minority language students, moderator Scott Enright commented on the difficulties involved in analyzing complex human phenomena such as second language learning. In attempting to make such analyses, social scientists often break down the processes into constituent parts and focus on one particular aspect. Enright cautioned that the whole process is often greater than the sum of its individual, theoretical parts and that care must be taken not to let an incomplete picture result in misapplications to practice.

Whatever their theoretical foundation, all approaches to English language development must, in the end, be judged by their effectiveness in promoting student learning. As research and theory provide new directions and approaches, the merits of any curriculum can only be evaluated through applications in the real-life situation of the classroom.

Presenters

Anna Uhl Chamot is coordinator of Research Information Services at the National Clearinghouse for Bilingual Education, Rosslyn, Virginia. Her experience includes the teaching of ESL theory and methodology in bilingual teacher education programs and foreign language methodology. Her research interests include English as a second language through mathematics and science content areas and cognitive strategies in second language acquisition. Previous publications have been in the areas of second and third language acquisition, ESL through the content areas, and learning strategies for second language acquisition.

Norman Gold is a consultant for the Office of Bilingual Bicultural Education in the California State Department of Education. With a background in languages and linguistics, he has worked in the areas of school evaluation and bilingual education curricula. His publications include work in oral language proficiency testing and competency testing. He is currently working on case studies of bilingual programs at the elementary school level.

Kenji Hakuta is an associate professor of psychology at Yale University. He is conducting an ongoing research project with the New Haven public school system on bilingualism and cognitive development. He has recently completed *Mirror of Language: The Debates on Bilingualism*, published by Basic Books and available in fall 1985.

J. Michael O'Malley is a senior associate at InterAmerica Research Associates in Rosslyn, Virginia, and is an adjunct professor at George Washington University. His publications are in the areas of second language acquisition, minimum language surveys, and program evaluation. He is currently working on a study of the academic achievement of Hispanic high school students.

Moderator

Scott Enright, formerly an elementary bilingual teacher, is an associate professor of early childhood education and the director of the Georgia State University Bilingual/ESL Teacher Training Project. His research interests include the process of literacy development in second language acquisition, second language oral development in children, and models of bilingual/ESL curricula. He has published various articles on the philosophy of education, curriculum and second language models, acquisition, and classroom discourse.

English Language Development Through a Content-Based Approach

Anna Uhl Chamot

The development of second language skills through teaching modified subject matter content has the potential for assisting limited-English-proficient (LEP) students in the development of the academic language skills they need to participate successfully in the mainstream classroom. Rather than focusing on language forms and functions alone, content-based second language instruction also develops conceptual knowledge appropriate to the student's grade level. This approach has the potential for developing what Saville-Troike (1984) has termed *academic competence*, or the ability to learn through English, rather than the ability to merely communicate in English. Whether this potential is realized or not depends in large part on four important factors:

- An understanding of the nature and objectives of content-based language development;
- The training and selection of teachers to deliver content-based instruction to LEP students;
- The structuring of the content-based English language development (ELD) curriculum;
- The instructional approach best suited to deliver this curriculum.

The purpose of this paper is to provide an overview of these four areas, pointing out both benefits and potential hazards of content-based ELD.

Objectives of Content-Based English Language Development

A content-based approach to ELD seeks to develop both second language skills and academic concepts appropriate to the student's grade level. Mohan (1979) describes three types of content-based second language instruction: in the first, the focus is on the content, and language skills develop incidentally; in the second, both content and language

teaching are formally incorporated into the instructional approach; and in the third, the specific type of language needed for a particular subject or discipline is taught as preparation for content instruction in the target language.

In planning which of these three types of content-based instruction may be most beneficial to a particular group of LEP students, identification of the principles that are important for the English language development aspects of the approach need to be considered. Of primary importance are the specification of the instructional objectives for the students concerned; the vocabulary and language functions needed to meet these objectives; and the language skills required, whether listening, reading, speaking, writing, or a combination of these skills.

For instance, the instructional objectives for students in kindergarten and first grade primarily involve the development of initial basic skills, including special emphasis on language skills, so young children may be able to acquire these aspects of the new language through Mohan's first type of content-based second language instruction, exposure to modified content alone. Success in this type of content-based instruction has been reported in studies of immersion programs in Canada. For the older elementary student who has not had the first years of formal schooling to develop oral proficiency and initial literacy in the new language, mere exposure to modified content may not be sufficient to develop academic competence in English, and these middle and upper elementary students may profit more from Mohan's second type of content-based instruction, in which specific language teaching is combined with content teaching. Secondary school LEP students have only a few years in which to learn the English they need to graduate from high school, and for them, Mohan's third type of content-based instruction may be necessary so that they can learn the specific language required for different subjects as quickly as possible. Thus, all three types of content instruction may be advantageous in developing academic language skills and concepts at different grade levels and levels of English proficiency.

An important benefit associated with content-based ELD instruction is increased student motivation (De Avila and Duncan 1984). A content area that is intrinsically interesting can be expected to motivate students more than a study of language for its own sake.

The most important thing that teachers need to understand about content-based instruction for LEP students is the language development component. This consists of:

- Vocabulary and technical terms associated with the subject (e.g., math, social studies, science);
- Language functions needed for academic communication (e.g., informing, explaining, classifying, evaluating);

- Language structures and discourse features associated with different academic disciplines (e.g., use of passive constructions in science texts or lack of redundancy in math word problems);
- Language skills emphasized in the classroom for different academic functions (e.g., listening comprehension for academic explanations, reading for information, speaking for oral presentations, writing for reports).

The language development component is what distinguishes a content-based second language approach from merely simplified mainstream content instruction. Without a clear understanding of the ways in which language can be developed through content, nonspecialist teachers could perceive it as no different from instruction for native English-speaking students. The hazard to be considered is that if content-based ELD instruction is really no different from mainstream teaching, the program can easily become a submersion approach to learning English, in which students learn neither English nor content.

Teacher Preparation

A serious difficulty in implementing content-based instruction for ELD is in the selection and training of teachers. The ideal teacher of content-based ELD is one who can teach both the content subjects of the curriculum and English language development and has the ability to intertwine the two. Elementary school teachers often teach all subjects in the curriculum, and when ESL training and experience are added to their preparation, they can develop the expertise to provide content-based ELD instruction. Secondary school teacher preparation programs, on the other hand, usually train teachers to teach one or two content subjects only. In high school, therefore, close collaboration between ESL teachers and content teachers in planning, teaching, and evaluating activities that develop both the academic language skills and concepts of their LEP students is essential. In addition, inservice training for content teachers in ESL methodology and for ESL teachers in content areas would be beneficial in developing a content-based instructional approach. The need for teacher training in content-based ELD is demonstrated by a recent survey of secondary ESL teachers in which the top instructional priority was considered to be strategies for ESL instruction in the content areas (McGroarty 1985).

Curriculum Structure

The Canadian immersion model is often identified as a successful curriculum for content-based bilingual education. In this model, young

English-speaking children receive instruction in all subjects in French, their second language; the instruction is modified so that they can comprehend it; the teacher understands English, but does not use it for instruction; and children begin to have instruction in their first language after several years of instruction solely in their second language.

This model is difficult to implement in the United States for a variety of reasons. First, the Canadian students in these immersion programs are majority language middle-class children. Second, the children all start together in kindergarten and gradually acquire both language and concepts as they move up through the grades as a homogeneous group. Third, all the students share the same first language, and the teachers are bilingual—factors that facilitate the delivery of instruction that is comprehensible to the students. In the United States, on the other hand, the vast majority of LEP students are from low-income families; they enter school at every grade level rather than only in kindergarten; and in many schools they come from a variety of language backgrounds, so that a teacher would have to be multilingual in order to understand all the children's first languages.

Implementing a content-based language development curriculum has particular hazards for the older elementary and secondary school student. In an effort to make the subject matter of fourth, eighth, or eleventh grade comprehensible to the LEP student, teachers and curriculum developers may unwittingly be providing a watered-down curriculum for these students. An attempt to simplify the language of instruction can lead to the simplification of content. By making content less intellectually challenging, LEP students are effectively denied equal access to the mainstream curriculum.

Research has verified the existence of the watered-down curriculum and has also shown how it can be avoided. For instance, Moll and Diaz (1982) found important differences in the way bilingual third graders were instructed. In the Spanish reading class, the children in the high level group participated successfully in cognitively demanding reading comprehension activities, while the same children in the English reading class were not required or expected to do more than rote decoding. They were receiving a watered-down curriculum in English reading, and potential transfer of reading comprehension strategies developed in Spanish was neither encouraged nor even permitted to occur. In total contrast, another group of elementary bilingual children demonstrated significant gains in both conceptual knowledge and English through participation in an experimental math/science curriculum that not only provided bilingual instruction but also challenged children to think about the concepts they were learning (De Avila 1984).

Three cautions are in order in avoiding a watered-down curriculum. First, the content-based language development curriculum should not be

seen as a substitute for the mainstream curriculum, but rather as a preparation for it. Second, at upper elementary and secondary levels at least, intensive development of proficiency in all four language skills (listening, reading, speaking, and writing) needs to take place before grade-appropriate content can be taught successfully because, as Mohan (1986) indicates, content teaching will not be successful if students do not have some basic understanding of the language in which the content is presented. Third, even though the language of the content-based curriculum may be simplified, the development of higher order skills and concepts should be an integral part of such a curriculum.

An example of careful sequencing of a language skills and content-based curriculum is found in the High Intensity Language Training (HILT) program in El Paso, Texas (Apodaca 1985). In this program, junior and senior high students with limited English proficiency begin by taking intensive English as a second language courses. In addition, they also take courses to develop the English language skills necessary for math, which is the content area considered least language dependent. Next, the students take a "sheltered" math course, which is a grade appropriate mathematics course especially designed for LEP students. Finally, they are mainstreamed into a mathematics class in which they must compete with native English speakers. In subjects which are more language dependent, such as science and social studies, students are provided with additional ESL instruction before they follow a similar progression from (1) learning first the language necessary for studying the subject to (2) a class in the subject in which they only compete with other LEP students to (3) a mainstream classroom in which they must compete with native English speakers in mastering the concepts of the particular discipline. Thus, this curriculum first prepares students in basic English proficiency, next teaches them the language specific to a particular discipline, then provides them with a meaningful learning experience in the subject without being pressured by competition from native English speakers, and finally moves them to the mainstream curriculum when they are prepared to compete successfully in both subject matter and English language proficiency.

Instructional Approach

A cognitive approach to second language instruction is more appropriate to a content-based ELD curriculum than is a communicative approach that focuses on social interactive skills. A cognitive approach makes use of prior knowledge and emphasizes the information processing capability of the learner. A recent development within cognitive approaches to second language learning is work done on learning strategies which indicates that students can be trained by teachers to

become more effective learners (Chamot and O'Malley 1984; O'Malley et al., in press). Learning strategies are special techniques that students can use on their own to help them learn and remember new information; the strategies can be applied in both language and concept learning.

A cognitive approach to second language instruction coupled with a content-based language development curriculum would have both similarities and differences from a purely communicative approach to second language teaching. Both approaches focus on the communication of meaning through a second language rather than on drill and practice of grammatical patterns. In both approaches, small group activities in which students engage in cooperative problem solving provide opportunities for active and meaningful practice of the second language. The two basic differences in these approaches are in *what* is learned and the *language skills* that are emphasized.

- A *communicative* approach focuses on the notions and functions underlying sociolinguistic competence.
- A *cognitive* approach for the content-based second language curriculum focuses on the notions and functions underlying academic linguistic competence.
- A *communicative* approach emphasizes the development of the listening and speaking skills that will permit the second language learner to interact in a socially appropriate way with speakers of the target language.
- A *cognitive* approach for the content-based curriculum emphasizes the development of the reading, writing, and academic oral language skills that permit the second language learner to use the target language to participate successfully in the mainstream curriculum.

Conclusion

This paper has presented a description of some of the major components of a content-based second language development program and has discussed some benefits to be expected, some potential hazards to be avoided, and some problems to be solved.

Two potential hazards are that content-based language development instruction in the hands of teachers without specialized training could become another name for submersion or could result in a watered-down curriculum. Problems to be solved include provision of additional teacher training, the sequencing and integration of the language and content components of such a curriculum, and the preparation of instructional materials designed to develop academic language skills through content instruction.

The potential hazards can be avoided, and the inherent problems can be solved. We need to do so because the benefits that can emerge from a content-based approach to second language development are great. This type of English language development program is designed specifically to address the need of LEP students in this country to gain the academic competence they need to compete successfully in the mainstream curriculum. By competing successfully in school, these students can obtain access to participation in the mainstream of U.S. life.

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Competency Testing for Limited-English-Proficient Students

Norman C. Gold

For centuries we have employed various techniques to determine whether our students have learned what we have taught, but the widespread movement to assess school competencies (variously referred to as minimum competencies, proficiencies in basic skills, or merely basic skills) has been with us only since the mid-1970s (Glass 1978).

I believe that the competency testing movement is ill-advised, and that it will, by itself, yield few improvements in our schools. It will ultimately be found to have engendered arbitrary barriers to progress in school for some students, while focusing our attention on a selected few (mainly trivial) skills. The movement is grounded in the scientific method, yet lacks the necessary scientific rigor to ensure that the results of competency tests will be valid and reliable (Glass 1978).

In spite of these shortcomings and the attention drawn to a new list of mid-1980s school reforms, the competency testing movement has gained considerable momentum, and so will be with us for some time. It may, in some schools, stimulate better instruction for limited-English-proficient (LEP) students, but while some good might come from competency testing, it currently poses a series of problems and challenges.

We do know that various states have reported a greater failure rate on competency tests for minority language and racial/ethnic minority students than for nonminority students, but little information exists regarding the impact of competency testing programs specifically on LEP students.[1]

Legislation in Florida, New Jersey, California, and other states established either statewide assessment programs or mandates for local school districts to develop their own competency assessment standards. Often these assessment programs were coupled with sanctions for students failing to pass specific tests (retention at selected grades or denial of a high school diploma). Some programs, such as Rhode Island's (RIDE 1984), avoided the sanctions and instead recommended to schools the teaching of selected proficiencies at lower grades and then recommended course content for those courses required for high school graduation.

The competency testing movement generally assumes that English is the only language of teaching and assessment. These English-only assessment programs have sought to set goals and benchmarks for performance in the three main skills areas—reading, writing, and mathematics.

The present discussion is limited to programs assessing these general school competencies.[2] Other assessments of LEP students (e.g., English language proficiency, academic achievement) present similar instructional and psychometric challenges but are beyond the scope of this paper.

Competency Testing and Better Instruction

The competency testing movement may stimulate the improvement of education for LEP students in four ways. These are similar to the improvements anticipated for all students and include the following possibilities. Competency testing can:

- Increase the cohesion and organization of the curriculum and the clarity with which grade-level objectives are stated;
- Guide the use of scarce resources for remediation to those students most at risk of not mastering basic skills;
- Motivate teachers, students, and their parents to strive for higher standards of performance;
- Hold schools and teachers more accountable for the results of their efforts.

Problems with Competency Testing

There are many who argue that a good competency testing program can accomplish these improvements in schooling for all students. Nevertheless, competency testing programs present several major challenges specific to our work with LEP students.

Language of the test. Competency testing conducted only in English confounds language proficiency with the skills to be tested.

Grade retention. When the results of English-only competency testing serve to bar students from passing to the next grade, the students are subjected to unreasonable barriers to progress in school—exactly those barriers which were prohibited by the Supreme Court in *Lau* v. *Nichols* in 1974.

Diploma sanction. A diploma sanction imposed on an older LEP student may be an unreasonable barrier due to the limited notice available to the student and to the limited opportunities that may be available for acquiring English proficiency and the academic skills covered in the competency test.

Marketing. Inadequate marketing of the competency testing program to minority language students and their parents through community media and in their own language may result in inadequate notice of the standards and any sanctions, lack of support for the school program, and lack of understanding of the procedures for remediation.

Psychometric rigor. Flaws in test construction, scoring, and interpretation may be so severe as to make accurate predictions of mastery of the school's objectives virtually impossible. In addition to the language of the test, relative item difficulty, cultural bias, and other factors may serve to disadvantage minority language students.

Remediation versus continued language development. Instruction intended for remediation of academic skills may be inappropriate for LEP students who merely need to continue a normal course of second language development. Many of the elements of such instruction may be similar but will fail to support the student's development if teachers incorrectly assume that they are remediating academic deficits.

Language of instruction and remediation. The language of both initial instruction and any remediation based on competency tests should be the language indicated by a careful diagnosis of relative language proficiency and by an assessment of related school and community factors. The non-English speaker diagnosed in Spanish as having a need for remediation in mathematics applications should receive the math remediation instruction in Spanish, if at all possible.

Options for Educators

Each of these challenges has at least one response that may improve the impact of a competency testing program on LEP students.

Language of the test. Assessment of LEP students in English may give results highly correlated with the mastery of English but not at all correlated with the mastery of the reading or math skills tested. Competency tests given at grades 3, 6, and 8 might be developed in several language versions in addition to English. Such an approach is permissible in California, and California school districts are encouraged to use en route assessments in English or the primary language to diagnose student needs and to gauge the students' acquisition of important school-related skills. Final mastery of skills for the high school diploma must be demonstrated in English, however.

Grade retention. Grade retention should be avoided whenever possible, especially for LEP students who have mastered grade-level skills even though they may not yet be able to demonstrate these in English.

Diploma sanction. In those states or school districts that impose a diploma sanction for failure to pass the high school competency tests, extra precautions should be taken to communicate the existence of these

sanctions to LEP students and their parents in advance and to advise them of the realistic possibilities of completing a diploma within the normal four-year term. Students need not leave high school at age 18 in most states, and many students may be encouraged to stay one to two additional years to acquire sufficient English and academic skills to pass the competency tests. In addition, LEP students may be encouraged to enroll in adult education programs, community colleges, or work-study programs in preparation for a GED (Certificate of General Educational Development—equivalent to a high school diploma for many purposes). In some states the GED may be taken in Spanish or other languages.

Marketing. The primary language may be used to provide information to parents and community members about the competency plan in newsletters or bulletins. The state of California has printed brief explanations of the competency requirements in several languages and has disseminated these to parent and community groups. As information regarding student progress is compiled, these groups should be informed about the rate of progress of minority language students and other groups in meeting the grade-level competency goals.

Psychometric rigor. Local- or state-mandated competency tests should be carefully evaluated to ensure that:

- The desired competencies (skills, proficiencies, instructional objectives) are clearly defined;
- Items are correctly devised to provide both an economical and sufficiently thorough sample from the field of all possible items that might be used to assess the objectives;
- There is a sufficient theoretical and practical underpinning for any assessment approaches chosen;
- Normal precautions are taken to ensure test reliability and validity (CSDE 1982).

Remediation versus continued language development. Limited-English-proficient students may need extensive oral language development, enhancement of general school readiness, orientation as to how schools operate in the United States, motivation for learning, instruction in logic, and so forth, rather than remediation of specific reading skills. Teachers must learn how to discern the difference between these skill areas.

Language of instruction and remediation. With LEP students care should be taken to teach the required competencies at each grade without duplicating efforts in both languages. Which of the competencies must be taught in English (e.g., the ability to write standard English) and which may be developed in the primary language or ESL classes as the

student is acquiring English (e.g., the ability to improve one's own writing by restructuring, correcting errors, and rewriting) should be determined. A large number of the competencies that appear in state and local competency plans may be developed in any language.[3]

Summary

State and federal equity guarantees require that minority language students be provided programs that ensure the acquisition of the competencies required of all students. Minority language students may not be able to acquire these competencies if assessments en route to high school graduation are not valid and reliable. Testing bias or inadequate remediation to overcome the effects of prior discrimination may lead to higher rates of attrition of minority language students.

Increased course requirements, a greater reliance on tests in English, and higher expectations of skills demonstrated only through English may lead to a greater alienation from school, an increased number of dropouts among minority language students, and a lack of development of either academic or career skills among this special population. The achievement gap between minority and nonminority students may widen rather than narrow in an age in which we are increasingly dependent on literacy and on computational and analytical skills for all aspects of life.

Students, parents, and schools will all need to share the responsibility for holding all parties accountable for both the mastery of specific academic competencies as well as the mastery of the English language. But care must be taken to ensure that minority language students are provided with genuine opportunities to build the skills they will need for future success.

Notes

1. For a more extensive treatment of the relationship between competency testing and LEP students see Gold (1984).
2. There is a continuing debate about whether competency tests should cover both school skills (the mastery of which predict success in further schooling) and life skills (the mastery of which predict success as an adult in out-of-school settings) (Glass 1978). Schools have mainly chosen the former.
3. See Hudelson (1981) and Thonis (1983) for a discussion of the relationship among reading skills in various languages.

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Cognitive Development in Bilingual Instruction

Kenji Hakuta

Our metaphors for the human mind are filled with allusions to the image that it is a container with limited capacity. We cram for exams, vent our frustrations, and empty our minds. If the mind is a vessel to be filled, and if language is something that fills it, then one might ask some serious questions about the consequences of bilingualism on mental development. Two languages take up more room than one, and thus one might wonder whether the process of becoming bilingual might impede the mental development of the individual by taking up too much space, as it were. To the extent that one believes in this general idea, one could oppose bilingual instruction in young children on the grounds that it would be detrimental to their overall cognitive development. I am sure that practitioners in bilingual education have all heard variations aplenty on this theme from various opponents of bilingual education. In this paper, I would like to comment on the question of bilingualism and cognitive development, particularly in research relating to current U.S. bilingual education.

There is a curious history to the psychological research behind the cognitive development of bilingual children that needs some elaboration, if only because this history has not been told often enough. The issue dates back to the turn of the century when there was concern in this country about the poor performance of immigrants—particularly those of southern and eastern European origins—on intelligence tests. How could their inferior performance on these tests be explained? Those who believed intelligence test performance to be determined by heredity, including psychologists such as Lewis Terman and Florence Goodenough, were willing to explain this inferior performance by saying that the immigrants were from groups with low innate intelligence. On the other hand, those who argued for the environmental influences on intelligence looked around for other explanations and found the cause to be in bilingualism. The environmentalists argued that the attempted use of two languages resulted in mental confusion. Thus, for environmentalists, the new immigrants were of inferior intelligence not because of their genes, but because of their bilingualism (Hakuta 1985).

The environmentalist account of the negative consequences of bilingualism went hand in hand with efforts by behaviorist psychologists to explain the mental composition of individuals in terms of overt behavior. Indeed, much of what we call code switching in bilinguals today was presented in those days as evidence for mental confusion (Smith 1939).

Beginning in the late 1950s, the tide in the social sciences turned away from the behaviorist (sometimes called empiricist) orientation toward what is called a cognitivist view. Changes in the philosophical orientation of an entire community of scientists are difficult to link with particular individuals, but one major catalyst for change was the linguist Noam Chomsky, who argued effectively that our language and mental capacities are far more powerful and interesting than what can simply be observed in behavior. The cognitivists introduced the new metaphor of the mind—not as that of a container that is the receptacle for information introduced from the outside—but rather as a machine with wired-in properties, a problem-solver, that stands ready to be stimulated (but not created) by the environment.

As the era of the "cognitive sixties" began, perhaps not coincidentally, Elizabeth Peal and Wallace Lambert at McGill University in Montreal conducted their important study (published in 1962) on the relationship between bilingualism and intelligence. What they found was that bilingual children who were equally proficient in both their languages, when compared with a similar group of monolingual children, showed better performance on all sorts of measures of intelligence. Their finding, which suggested that bilingualism might have a positive effect on intelligence, contradicted the claims of the earlier research of the behaviorist psychologists. For Peal and Lambert, their own finding was not troubling because they did not share the behaviorist views of the mind as the passive receptacle of experience. Rather, they viewed the bilingual mind from the cognitive perspective, as one that eagerly tries to solve problems presented by the environment. Presumably, a mind that has worked on two problems, i.e., learning two languages, has had more experience solving problems than a mind that has worked on just one language. Thus, Peal and Lambert (1962, 20) characterized a bilingual child as "a youngster whose wider experiences in two cultures have given him advantages which a monolingual does not enjoy. Intellectually his experience with two language systems seems to have left him with a mental flexibility, a superiority in concept formation, a more diversified set of mental abilities. . . . In contrast, the monolingual appears to have a more unitary structure of intelligence which he must use for all types of intellectual tasks."

Since Peal and Lambert's seminal study, a large number of studies have been conducted with bilingual children in various parts of the world using a variety of tasks of mental performance (Diaz 1983; Cummins 1984;

McLaughlin 1984). The results generally support Peal and Lambert's conclusion of the superiority of bilinguals. Such results, if true and not the result of experimental artifact, would be encouraging to the support of bilingual education, since they suggest that (1) the fear that two languages would overload the mental capacity of children in unfounded and (2) there could be an advantage of bilingualism over and beyond the obviously beneficial fact that the children would know two languages.

One problem, among others, that has plagued the ability to make generalizations from these conclusions to the case of bilingual education in the United States has to do with the fact that most of the studies were conducted with subject populations other than U.S. minority language students, the primary exceptions being studies by Duncan and De Avila (1979) and Kessler and Quinn (1980). Our research with Puerto Rican elementary school students in the bilingual program in the New Haven Public Schools attempted to extend these findings to a subject population more relevant for generalizations in the U.S. context (Hakuta 1984; Hakuta and Diaz 1984; Galambos and Hakuta 1984; Ferdman and Hakuta 1985). In addition, we corrected for a number of methodological problems with the standard research paradigm utilized in most of the research. For example, rather than trying to compare our bilingual sample with a group of monolingual students, we decided to look *within* the bilingual group to see if intellectual abilities are related to the students' degree of bilingualism (Hakuta and Diaz 1984).

What we found, indeed, is that even within our low-income, Hispanic minority language sample, using relatively rigorous experimental controls, a positive relationship exists between bilingualism and various abilities. For example, there was a positive relationship between bilingualism and the students' ability to think abstractly about language (a skill that has been called metalinguistic ability and is hypothesized to be related to reading ability in elementary school students). We also found a relationship between bilingualism and nonverbal thinking as measured by a standard test of intelligence.

We should be cautious about the implications that this finding would have on practice. For example, would one want to use bilingualism as an intervention with which to raise children's cognitive performance? If I were asked this question, I would give a firm "no." The magnitude of the effect of bilingualism on cognitive ability *in isolation* is hardly large enough to justify such a rash move, even though the effect may be statistically significant, as McLaughlin (1984) has pointed out. However, if bilingualism in and of itself were a desirable end product of education for whatever other reason, be it that it expands the worldly perspective of children or enables them to participate more broadly in world events, then enhanced cognitive ability would be a superb premium to go along with bilingualism. Indeed, what I think matters most in all of this research

is the finding that there are no negative cognitive effects of bilingualism. What we now know is that the mind is not a passive receptacle with limited capacity, but one that benefits from diversity of experience and is capable of building upon itself.

One of the more encouraging findings from our study is the fact that there is an increasing correlation between the abilities of the children in the two languages over time. That is, when the students first entered the bilingual program, their abilities in Spanish and English were unrelated. However, by the end of three years, there were correlations as strong as $r = .70$ between the languages. The pattern of correlations also suggested to us that children who came in with a strong base in their native language, Spanish, ended up with the strongest abilities in English, a finding that supports Cummins's contention of the interdependence of the languages of the bilingual. One implication of this finding is that the development of either language can be used as a foundation for the development of the other.

Now that we have answered the question of the role of bilingualism in cognitive development, at least in a general way, what next? Of primary importance to practitioners in bilingual education, I believe, is the question of whether, and how, skills acquired in one language transfer to the other. For example, how do grammatical concepts and rules acquired in Spanish reading transfer to reading in English? The importance of transfer for the practitioner in bilingual education has been underscored by Chamot (1983) in her important piece "How To Plan a Transfer Curriculum from Bilingual to Mainstream Instruction." Research by Susan Goldman (1983) indeed suggests that similar strategies are employed by children in narrative comprehension in L_1 and L_2. This area of cross-language transfer of skills, I believe, is an important avenue of research in clarifying the role of bilingualism in academic learning and is an area of research where we have just embarked on a systematic series of studies in New Haven. This kind of research geared specifically to the academic skills that are taught in the classrooms can be immediately filtered back to the practitioner through curriculum development that is responsive to the particular tasks that do and do not transfer readily. We are particularly excited because this program of research is just at the level of analysis where both theory and practice can co-exist and be mutually reinforcing.

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Learning Strategy Applications to Content Instruction in Second Language Development

J. Michael O'Malley

Research on the role of the learner as an active participant in the teaching/learning process suggests that modified content instruction holds promise for influencing the development of second language skills. This research indicates that the effectiveness of learning depends on how the student thinks about the new task as well as the way in which the student uses prior knowledge to construct meaning. Students have been taught active processing skills for first language reading and content tasks (Weinstein and Mayer, in press; Wittrock 1985) and second language receptive and productive skills (Atkinson 1975; O'Malley et al. 1985). What is now required is conceptualization and research to combine strategy instruction in first language content areas with strategy instruction in second language learning for minority language students.

This paper identifies basic conceptual processes, or *learning strategies*, for learning academic content that may also be used in learning a second language. The paper begins with a brief description of the rationale for viewing learners as active conceptual processors. The paper then discusses the general types of learning strategies found to influence second language learning and the learning strategies reported to be useful in learning academic content. The paper concludes with a description of procedures by which second language learning can be combined with a modified form of content instruction so that minority language students are introduced to learning strategies as they are exposed to academic content in English.

Learners as Conceptual Processors

In recent years explanations of classroom learning have included what the learner does with new information as well as what the teacher does in presenting the information (Weinstein and Mayer, in press). This emphasis on the student as a learner coincides with the shift from behavior-

or stimulus-oriented explanations of learning to explanations based on cognitive psychology or on the mediating conceptual processes involved in learning. Accompanying this shift, research on classroom learning extended beyond the teacher, who controlled the stimuli for instruction, to the learner and how the learner conceived the new information. In this cognitive view, students actively process new information and use special learning strategies to acquire ideas and concepts more effectively. As Schulman (in press) notes, "the consequences of teaching can only be understood as a function of what that teaching stimulates the learner to do with the material."

Learners are viewed in the cognitive approach as able to direct and influence the kinds of conceptual processes they use and to learn new conceptual processes as the situation demands (Brown, Bransford, Ferrara, and Campione 1983). They can exercise executive or *metacognitive* processes that entail planning for and monitoring learning as well as evaluating the success of a learning activity. These metacognitive processes often appear to operate independently of the specific nature of the learning activity. Learners also exercise *cognitive* strategies that involve direct conceptual manipulation of the specific learning task, rehearsal strategies, reorganization of new information, or elaboration of information through special ways of constructing meaning. These special ways of constructing meaning may involve relating new ideas to information learned in the past or relating one new idea to another. In addition, learners may use *social/affective* strategies in which the learners acquire or verify new information through social interaction with either peers or instructional staff. Peer cooperation and asking questions for clarification are examples of social/affective learning strategies.

Some of the principal findings from research based on this cognitive view of learning (Weinstein and Mayer, in press) are derived from studies of reading comprehension and general problem solving. The use of learning strategies appears to be developmental, appearing rarely at age 5, but appearing in preliminary form with some learners about age 6–7, and in a more stable form among most learners by ages 10–11. Strategies are used regularly by more effective learners and rarely or inefficiently by less effective learners. Because strategies are used in different ways by students, it is important to understand how the learner conceives of the learning task. For example, students who believe that reading comprehension will result from learning more vocabulary will not make effective use of elaboration and inferencing. Strategies can be trained among students who are not accustomed to using them, thereby increasing the effectiveness of learning. This involves more than simply embedding the strategies in the curriculum. Teachers should make an active effort to teach the strategies and to show how they can be used in learning. The teacher thereby provides the learner with a set of tools that can be

generalized to other learning tasks, leading to autonomy in learning for the student.

Most importantly, strategies can be used in content area instruction as well as in reading comprehension, thereby extending the applications of the cognitive view of learning into other areas of the curriculum. Learning strategies essentially identical to those discussed above with variations appropriate to the subject area have been used in mathematics, sciences, and social sciences. The thrust of these strategies is on providing students with tools for learning that are more efficient and effective than simple repetition and rote learning of facts. In mathematics, for example, students are taught strategies for handling word problems that involve analysis into the basic mathematical operations required for problem solution (Cuevas 1984). In content area tasks that involve reading, strategies shown to be effective in reading comprehension in general can be used with science materials, e.g., summarizing, elaboration, and note taking (Wittrock 1985). In both science and math, efforts have been made to understand the student's conceptualization of the problem as a necessary step in demonstrating how the student's view can be extended to approximate scientific knowledge. This involves more than just teaching what the child does not know but providing experiences that build on existing concepts. As Wittrock (1985, 5) notes, "the processes of learning and memory center on getting meaning from experience by generating relations between knowledge and events or ideas in the classroom."

Strategies in Second Language Learning

Recent theories of second language learning indicate that conceptual processes play a major role in developing receptive and productive language skills. For example, Wong Fillmore and Swain (1984) pointed to the interaction of cognitive processes with social and linguistic processes as the key to understanding second language acquisition. Among the cognitive processes identified by Wong Fillmore and Swain were inferencing, association, and categorization or grouping strategies. Similarly, Bialystok (1981) gives a prominent role to learning strategies in her model of second language learning and identifies four classes of strategies: inferencing, monitoring, formal practicing, and functional practicing. She suggests that the strategies may vary depending on the learning task.

Research as well as theory suggests that learning strategies assist learning a second language. Studies of "good language learners" have indicated that individuals who have been successful in learning second languages use a variety of strategies to assist their learning (Naiman, Froelich, Stern, and Todesco 1978; Rubin 1981). Both cognitive and metacognitive strategies have been used by second language learners to

assist learning receptive and productive language skills (O'Malley et al. 1985). Among the metacognitive strategies are selective attention, monitoring, and self-evaluation. The cognitive strategies reported to be used by students include inferencing, grouping, imagery, auditory representation (sounding the word out in one's mind), note taking, and elaboration. In addition, second language learners have been found to make effective use of social/affective strategies such as peer cooperation and questioning for clarification.

Since many of the same tasks are involved in second language learning and native language reading comprehension and problem solving, the strategies used by learners in these areas are often similar. For example, first language reading comprehension is a receptive skill that has strong parallels with reading comprehension in a second language and, in addition, with listening comprehension. Strategies such as selective attention, monitoring, inferencing, elaboration, grouping, imagery, and note taking may be fundamentally similar for learning in both first and second languages. Similarly, writing in a first language is a productive skill that has parallels with second language writing and with oral production. Strategies that are useful in language production such as advance preparation, resourcing (using reference documents), and transfer can be applied to learning tasks irrespective of the language used or the mode of production.

A Modified Form of Second Language Content Instruction

Modified content instruction in second language learning incorporates learning strategies required for effective learning and adapts these for use by students who are not fully familiar with the second language. Modified content courses in English should be made available to minority language students prior to content area exposure in mainstream courses so that the students have an opportunity to learn the skills required for successful performance. These students can be expected to have difficulty in learning the academic vocabulary and concepts of content areas when the students are also attempting to consolidate their expanding familiarity with English. The use of learning strategies in the content areas as well as in English as a second language along with familiar teaching strategies such as providing comprehensible input will assist these students in gaining the skills they require. The students will become acquainted with the lexicon and concepts in the content domain as they are learning effective strategies that can be used later in the mainstream courses. What is needed is a firm grounding in the content area concepts that can be established most effectively with modified content instruction in which learning strategies are incorporated.

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Implications for Teachers

Introduction

Papers in the preceding sections on "Theoretical Viewpoints" and "Instructional Implications for Students" contain consistent references to the integral role teachers play in the learning process. Teachers have been handed the responsibility of integrating the linguistic, cognitive, and psychosocial factors identified by researchers and theorists into classroom practices that will develop limited-English-proficient (LEP) students' English language skills. To lend direction in the emerging field of teacher education for instructional personnel serving LEP students, the five papers in the following section focus on academic and inservice teacher preparation aimed at assisting LEP students develop linguistic and academic competence.

McKeon identifies common components in teacher preparation requirements for bilingual, English as a second language (ESL), foreign language, and mainstream teachers and discusses how these commonalities can be used as a resource for developing and implementing effective training programs. Collier examines teacher training programs at the university level and presents models for certification standards and innovative curricula for ESL and bilingual teacher training. Mercado, on the other hand, presents a model of inservice training for educational personnel and community members developed by the New York Bilingual Education Multifunctional Support Center (BEMSC). Cuevas also addresses the issue of inservice teacher training, but from the perspective of training teachers to develop LEP students' academic competence, specifically mathematics skills. Saville-Troike expands upon the issue of developing academic competence by discussing the teacher qualifications necessary to provide classroom instruction that will foster academic competence.

According to Saville-Troike, it is the responsibility of teacher training programs to address the question of "how teacher training may contribute to the academic competence of LEP students." ESL teachers, for example, cannot effectively develop LEP students' academic competence if the teachers do not know what academic content students are expected to learn. Cuevas presents a training model that addresses a persistent problem for teachers trying to develop academic competence in the content areas. The language used to teach content area skills and concepts often hinders LEP students. Cuevas' model reduces the language barrier and assists math concept comprehension.

The education of teachers serving LEP students is an emerging field. No one teaching method has been developed that can guarantee academic success for LEP students. Therefore, Saville-Troike advocates training teachers to understand the research and theory behind methodology as well as *what* to do. As Collier points out, most research findings in the area of the education of minority language students emerge out of a university context. This research should find its way back into teacher preparation programs where trainees and faculty can study the findings and apply the knowledge appropriately in the classroom—too often research does not play such a role. Mercado describes a training model used by the New York BEMSC in which teachers are encouraged to adapt or modify research findings to instructional practice.

Broad research themes stretch across four teacher training specialization areas: mainstream, ESL, bilingual, and foreign language. McKeon charts the overlap in teacher preparation requirements and argues that the separation of these training programs is often counterproductive. Collier and Cuevas express similar views. Cuevas supports sensitizing all teachers to the background and culture of the students and educating teachers to enable them to identify language problems that hinder concept comprehension. He is concerned with misconceptions about minority language students, such as the notions that mathematics is a universal language and that students, regardless of their proficiency in English, can master the math concepts and skills with little trouble. Collier urges bilingual/multicultural faculty to find ways to infuse the mainstream teacher preparation curriculum with elements of bilingual/multicultural/ESL training.

Teacher training programs should build upon the expertise and knowledge base of the participating teachers. Mercado calls this a collegial approach. Trainers are collaborators and mentors working closely with teachers, sharing, exploring, reflecting to achieve the same goal—quality instruction. Trainers need to visit classrooms to observe routines and confront daily problems. Cuevas incorporates an "in class" component into his training model.

In summary, the philosophy underlying all five papers is that "good teaching is good teaching." LEP students are striving to achieve the same academic goals as native English-speaking students—academic competence—and LEP students will benefit from the same academic excellence that benefits all others. The papers arrive at four common implications for teacher training that will lead to effective teaching. These implications are: (1) teachers should be trained to develop the academic competence of their students; (2) teachers should be taught to apply research findings in the clasroom; (3) ESL, bilingual, foreign language, and mainstream teachers should be trained in cooperative programs;

(4) training should be approached as a collegial process with trainers designing activities rather than specifying content.

In his closing remarks, moderator John Staczek credited the five presenters with nearly creating a new, integrative training model in that they call for cooperation among disciplines, recognition of common assumptions, and commitment to qualitative improvement in education and teacher training to ensure the academic success of not just LEP but of all students.

Presenters

Virginia P. Collier is the associate director of the Center for Bilingual/Mulicultural/ESL Teacher Preparation at George Mason University. She received her Ph.D. in intercultural education with a specialization in bilingual education and linguistics from the University of Southern California. She has recently coauthored *Bilingual and ESL Classrooms: Teaching in Multicultural Contexts* with Carlos Ovando (published by McGraw-Hill).

Gilbert Cuevas is a professor in the School of Education, Allied Professions at the University of Miami, Florida. His experience includes research in mathematics in the Caribbean and Central and South America. He co-directed a research and development project on the relationship of mathematics and language and has published in the areas of mathematics and bilingual education.

Denise McKeon is a senior trainer/coordinator of support services for the Georgetown University Bilingual Education Service Center. Since 1975, she has been involved in teacher training both here and abroad. Previous publications include *Testing and Teaching Communicatively Handicapped Children*, coedited with H. Dulay and M. Burt, and "Some Considerations in Planning Your In-Service Training Component" in *Bilingual Education Program Management: A Systems Approach.*

Carmen Mercado is program coordinator for the Instructional Services Component at the New York Bilingual Education Multifunctional Support Center and adjunct instructor in curriculum and teaching at Hunter College, New York City. Her previous experience includes eight years as a bilingual teacher. She has coauthored publications on language assessment and has given numerous presentations related to instruction for limited-English-proficient students, with emphasis on reading and language arts. Currently she is working on her doctorate at Fordham University in New York City.

Muriel Saville-Troike is a professor at the Bureau of Education Research at the University of Illinois. She is the coauthor of *Ethnography of Communication* and has published "What Really Matters in Second Language Teaching of Academic Achievement" in *TESOL Quarterly*. Her current research is on children's second language acquisition and the resulting first language maintenance/attrition.

Moderator

John Staczek is the assistant dean for graduate studies and assistant professor of linguistics in the School of Languages and Linguistics at Georgetown University. He has edited the volume *Perspectives on Bilingualism and Bilingual Education* with James Alatis, available from Georgetown University Press. His research interests include semantics, syntax, bilingualism, and intensive English program administration in higher education. *Varieties of Contemporary English: Implications for Teaching EFL and ESL* will soon be published by Kuwait University Press.

University Models for ESL and Bilingual Teacher Training

Virginia P. Collier

Many areas of stimulating research on the education of minority language students are bringing new awareness and maturity to the field. We heard today of exciting new theories and research findings in first and second language acquisition; of language and culture, and cognition and the content areas; and of a deeper understanding of the complexity of assessment issues. Institutions of higher education (IHEs) play a key role in the stimulation of this research through support of faculty and doctoral students, through dissemination of research findings, and ideally through an application of theory to practice in which research faculty work with teacher trainees and local schools to arrange cooperative ventures with universities.

This key role of IHEs points to the first obvious implication of the findings presented in other papers at this conference. Since most of this research emerged out of a university context with university (or perhaps federal government or private foundation) support, these findings should hopefully find their way back to teacher preparation programs where students and faculty can study, analyze, and apply the knowledge appropriately in classrooms. Do these research findings in our field get disseminated for use at the classroom level? What is happening in university bilingual and English as a second language (ESL) teacher training to help stimulate this growth?

To begin to address this question, I conducted an extensive literature review of sources on teacher training in ESL and bilingual education (BE). Just since 1980 over 250 articles and chapters in books have been written addressing some aspects of bilingual/ESL teacher training. Many important topics emerged as growing areas of concern for IHE faculty. Due to the brevity of this paper, discussion will be limited to the following:

- Bilingual and ESL teacher resources
- BE and ESL state certification, teacher competencies, and the IHE curriculum

- Current new curricular trends and influences of BE/ESL on general teacher education
- Assessment of teachers.

BE/ESL Teacher Resources

A brief look at statistical estimates shows that the needs in our field are staggering. For several years now there has been a national shortage of teachers in bilingual education, special education, math, and science. Of the 3.6 million limited-English-proficient (LEP) students (ages 4–18) identified in the 1978 Children's English and Services study (Waggoner 1983), only 30 percent were being served through bilingual and/or ESL instruction (Bell 1982). The rest were in sink-or-swim (submersion) mainstream classes.

The 1980–82 Teachers Language Skills Survey identified the need for 100,000 bilingual teachers if bilingual programs are implemented in schools in which LEP students from one language background are sufficiently concentrated to make such programs feasible. In 1982 there were an estimated 27,000 to 32,000 trained bilingual teachers, thus leaving 68,000 to 73,000 yet to be trained. Since 168 IHEs currently graduate approximately 2,000 to 2,600 trained bilingual teachers each year (Blatchford 1982), we have a long way to go. The Teachers Language Skills Survey also identified 103,000 teachers who were assigned to teach ESL but of whom only 40 percent had received any training in methods of teaching ESL. It was estimated that at least 350,000 teachers need specialized ESL training (O'Malley 1983; O'Malley and Waggoner 1984).

BE and ESL State Certification, Teacher Competencies, and the IHE Curriculum

As states have become increasingly aware of the need for bilingual and ESL teachers, through such factors as federal government influence, court decisions, or pressures of local minority language communities, states have passed legislation describing provisions for the schooling of LEP students and have developed accompanying state certification and/or endorsement requirements for bilingual and ESL teachers. As of 1984, 22 states had developed bilingual teacher certification, 23 had developed ESL teacher certification, while another 10 were in the process of development. Only 14 states had not begun the process of development of either ESL or bilingual teacher certification (National Clearinghouse for Bilingual Education 1984).

Certification requirements vary from state to state, and IHEs must design their curriculum in the teacher training program to meet state re-

quirements as a priority. Frequently IHE faculty are involved in the development of state requirements. I found no less than 40 published lists of various competencies for bilingual and ESL teachers. Some are published by individual faculty members to disseminate information about a particular IHE program. Some authors attempt to define competencies through bilingual teacher effectiveness studies (Clark and Milk 1983; Rodríguez 1980).

Probably the most widely disseminated lists are the Center for Applied Linguistics (CAL) guidelines for bilingual teacher certification (CAL 1974); the Teachers of English to Speakers of Other Languages (TESOL) guidelines for ESL teacher certification (TESOL 1975); and the Acosta and Blanco (1978) competencies for university programs in bilingual education. All three of these were drafted by several authors and underwent a review process. The National Association of State Directors of Teacher Education and Certification (NASDTEC) developed standards for bilingual and ESL teachers that were revised in 1984 and were designed to be a general model for state certification, based on the CAL and TESOL guidelines. Table 1 (see page 84) presents an abbreviated version of the NASDTEC competency guidelines along with suggested courses that might be offered at a university to meet each competency.

Missing from these NASDTEC specialization competencies are some important areas, such as curriculum development in BE and ESL, assessment of minority language students, and methods of teaching content areas bilingually. All of these would be covered by general education courses required of all teachers, but NASDTEC standards do not require that bilingual and ESL teachers receive specialization courses in these areas.

Here the dilemma begins for designing appropriate IHE curricula for the specializations. The more university faculty actively supervise field experiences and student teaching, the greater the perceived need for more specialized courses to adequately prepare teachers to face the special needs of students (Mohatt and Erickson 1981; Rivera and Simich 1982; Jacobson 1983). Equally strong pressure for specialized courses comes from the growing knowledge base generated by research findings on the schooling of minority language students (findings that need to be communicated to teachers in training). Yet, just as in special education, a proliferation of courses continues to be added to our specialization endorsement. While we are discussing increasing coursework for our specialization, general teacher education is getting heavy pressure to shorten the process and provide alternate routes to certification, such as the 200 hour (equal to four courses) preparation, plus one year of supervised teaching now being experimented with in New Jersey. This is minimal compared to most teacher education programs.

Table 1

NASDTEC Certification Standards (abbreviated)*

Content Standard in Bilingual/ Multicultural Education (B/M ED)	*Possible IHE Course Offerings*
1. Proficiency in L_1 and L_2, for effective teaching	Foreign language and English department courses.
2. Knowledge of history and cultures of L_1 and L_2 speakers	Cross-cultural studies, multicultural education (ME), history and civilization, literature, ethnic studies
3. Historical, philosophical, and legal bases for B/M ED and related research	Foundations of BE (or introduction to BE)
4. Organizational models for programs and classrooms in B/M ED	Foundations of BE
5. L_2 methods of teaching (including ESL methodology)	Methods of teaching a second language
6. Communication with students, parents, and others in culturally and linguistically different communities	Cross-cultural studies, ME, school/community relations
7. Differences between L_1 and L_2; language and dialect differences across geographic regions, ethnic groups, social levels	Sociolinguistics, bilingualism
Content Standards in English for Speakers of Other Languages	*Possible IHE Courses Offerings*
1. Nature of language, language varieties, structure of English language	General linguistics; English phonology, morphology, and syntax
2. Demonstrated proficiency in spoken and written English	English department courses
3. Demonstrated proficiency in a second language	Foreign language courses
4. L_1 and L_2 acquisition process	Language acquisition
5. Effects of socio-cultural variables on language learning	Language acquisition, ME, cross-cultural studies, sociolinguistics
6. Language assessment, program development, implementation, and evaluation	Language assessment, program development, and evaluation

*These are supplemental standards to the NASDTEC professional education standards required of all teachers (NASDTEC 1984).

New IHE Curricular Trends in BE/ESL

A Part C study of bilingual education teacher training programs found that state BE certification standards played a major role in determining the IHE curriculum for bilingual staff, with required courses mainly in culture, linguistics, and general issues in BE (RMC Research Corporation 1984). The NASDTEC standards also address issues in linguistics, culture, and general issues in BE and program development. We have already added curriculum development, assessment, and methods of teaching content areas bilingually to the NASDTEC list. To keep up with the latest trends, additional specializations within our field are growing rapidly—bilingual special education, computer-assisted instruction (CAI) in bilingual/ESL settings, and bilingual vocational education. Many teachers being certified for working in K-12 public school settings need at least an introduction to CAI and to some of the issues involved in bilingual special education.

Many teacher training programs are designed for bilingual and ESL teachers to receive different degrees, yet much of the coursework overlaps, and bilingual and ESL staff can benefit most from an integrated approach to training (Collier 1985). Figure 1 illustrates an idealized model that I would propose for an integrated bilingual/ESL teacher preparation program. Table 2 (see page 86) presents sample courses in an integrated training program for bilingual education/ESL teachers, incorporating all of the curricular areas described previously. The integration of bilingual and ESL teacher training is a major theme in a new textbook by Ovando and Collier (1985).

Figure 1

Integrating Bilingual and ESL Teacher Training

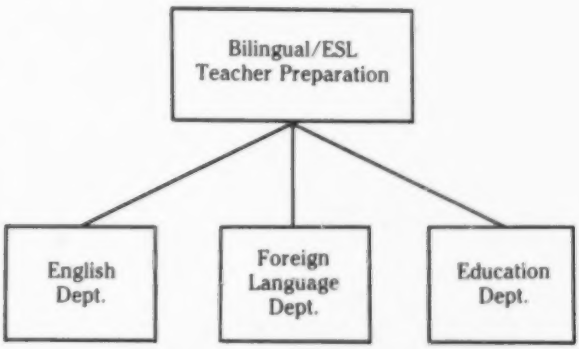

Table 2

Sample Courses in an Integrated Bilingual/ESL Teacher Preparation Program

- First and second language acquisition and bilingualism
- Teaching native language arts
- Methods of teaching a second language (e.g., ESL, SSL, VSL)
- Methods of teaching content areas, both bilingually and through the second language
- Multicultural education, including teaching the culturally and linguistically different exceptional child
- Program models, policy, school-community relations, and administrative issues in bilingual education and ESL
- The phonology, morphology, and syntax of English
- The phonology, morphology, and syntax of another language, in addition to English (for bilingual teachers)
- Assessment in bilingual/ESL settings
- Curriculum development in bilingual/ESL settings
- Reading and research in foundations of education (anthropology, sociology, history, philosophy, psychology, social psychology related to the education of minority language students)
- Use of instructional technology for teaching first and second languages and content areas

Now we are back to our dilemma. Ideally, in this integrated program bilingual/ESL professors who teach the courses come from multiple specializations and are active researchers, keeping up with the latest research findings on the schooling of minority language students. Yet we have created a specialization that is very separate from that required of mainstream teachers, many of whom also work with minority language students. These teachers also need exposure to issues and methods of working with special populations.

The bilingual/multicultural faculty at a university must find ways to infuse the mainstream teacher preparation curriculum with elements of bilingual/multicultural/ESL training. Some possible alternatives are mini-course modules taught by the bilingual/multicultural/ESL faculty in general teacher education courses and the creation of new required courses in the mainstream teacher preparation program to meet National Council for Accreditation of Teacher Education (NCATE) requirements in multicultural education and special education. Students with other lan-

guage backgrounds specializing in bilingual education also add important multilingual/multicultural content to mainstream courses through their participation in discussion, group projects, and seminars. The Part C study of bilingual teacher training programs (RMC Research Corporation 1984) found that the majority of IHE programs with specialization in BE have one-third of the coursework devoted to the specialization at the bachelors level and two-thirds at the masters level.

Assessment of Teachers

Established BE/ESL teacher competencies and IHE curricula designed to meet these competencies are not complete without appropriate assessment. No entry/exit criteria and assessment practices for IHE teacher training programs have been proposed at the federal level, but various states (e.g. California, Illinois) have taken initial steps to analyze complex issues in this important area.

For general teacher certification, the National Teacher Examination (NTE) is increasingly being used as a measure of teachers' skills in general and professional knowledge and in the content areas. For bilingual teachers, the addition of the specialization assumes some measure of proficiency in two languages, and knowledge and awareness of at least two cultures. In this paper I only have space to address very briefly a few language assessment issues.

Many IHEs assume that general university entrance requirements are satisfactory as a measure of sufficient English proficiency (e.g. the TOEFL, SAT, TSWE) for students entering the teacher preparation program. If students are provisionally admitted with a lower score on one of these tests, they are generally given remedial help through specialized ESL or English department courses, or from tutorial centers. For second language entrance assessment, bilingual program faculty usually require some combination of a commercial or noncommercial instrument (sometimes administered by the foreign language department), an informal interview, or classroom observation (Seidner 1982).

State certification requirements may determine the measure of proficiency in the two languages to be used upon exit from the teacher preparation program. Too often, a standardized measure for foreign language teaching that is not an appropriate measure for language use in a bilingual classroom is used. From research in language proficiency assessment, we know that integrated and pragmatic language tests are more complete and appropriate measures of language proficiency than discrete point tests and that valid measures should obtain an estimate of a teacher's receptive and productive language skills in the social and educational contexts in which the language will be used (Hamayan 1981; Seidner 1982; Duron 1983). Keller (1982) also questions in which language

variety (or varieties) teachers should be tested and the importance of measuring both basic interpersonal communicative skills (BICS) and cognitive-academic language proficiency (CALP) (Cummins 1979), including CALP in the content areas the teacher will be teaching. Some local measures have been developed in a few states, but much remains to be done.

In summary, university bilingual and ESL teacher training programs are maturing and expanding, but there is still much that remains to be explored and accomplished. A national survey of bilingual program faculty showed that we are relatively inexperienced, with directors averaging seven years of experience in teaching training, five years in bilingual teacher training, and five years in bilingual school teaching; and bilingual program faculty averaging five years in teacher training, two years in bilingual teacher training, and two years in bilingual public school teaching (Seidner 1982). Other measures of BE/ESL faculty involvement in active school-based research, faculty commitment to supervision of practicum experiences for students, and other important applications of research to the classroom are unknown at a national level. We are a young emerging field, but there are many highly committed bilingual/ESL professionals in higher education who are determined to institutionalize bilingual/ESL teacher training programs and who will work to strengthen the link between research and the classroom.

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Mathematics Education in a Second Language: An Instructional and Teacher Education Model

Gilbert J. Cuevas

Mathematical ideas are communicated in the classroom through a variety of means: graphically through manipulative materials, through formal and informal student-teacher and student-student interactions, and through text materials. The effectiveness of the ways in which these ideas are exchanged and communicated is an area in mathematics education that needs examination and research. The need to address this concern becomes critical when teaching students for whom English is a second language. Mathematics teachers at all grade levels report that students with limited English proficiency (LEP) encounter difficulties in understanding basic concepts and solving word problems. The language used to teach skills and concepts presents an obstacle in the learning process for those students who do not have a command of English (Austin and Howson 1979; Coffland and Cuevas 1979; Cuevas and Llabre 1981; Dawe 1983).

In recent years a number of conferences and professional meetings have addressed this issue.[1] The participants of these conferences have called for a systematic plan of research to investigate the role language plays in the learning of mathematics. In addition, the conferences have stressed the need to identify language problems that students have in mathematics, as well as instructional approaches that may help the learner overcome these problems.

It is the purpose of this paper to address each of the following questions in the context of the experiences the author and his colleagues have had as a result of a U.S. government-funded project that has been in operation for the past three years.[2]

- Can instructional strategies be developed to address the language problems minority language students may experience in mathematics? Can such strategies be developed given the knowledge we have regarding the role language plays in the learning of mathematics?

- If such instructional strategies can be developed, what are the skills that teachers will need to implement language-related activities in the mathematics classroom? How can teachers be motivated to participate in this training?

An Instructional Model

The overall picture that emerges from research studies concerning minority language students and mathematics achievement is neither clear nor conclusive. One strategy in designing instructional approaches for teaching mathematics in a second language is to address those variables that have been identified as playing a role in the learning of mathematics by LEP students.[3]

The relationship between language factors and mathematics achievement is not clearly understood, but it may be appropriate to assume that in order for a student to master the mathematics concepts, the language of the concepts must be mastered. Based on this premise, the Second Language Approach to Mathematics Skills (SLAMS) was designed to provide teachers with strategies for dealing with LEP students in the mathematics classroom (Cuevas 1981, 1984; Cuevas and Beech 1983). SLAMS follows a diagnostic-prescriptive approach to teaching mathematics, incorporating strategies for dealing with language skills to assist LEP students in mastering mathematics content. The model is composed of two strands, one focusing on mathematics content, the other emphasizing related language skills. The activities developed for each strand are based on identified instructional objectives from the curriculum the teacher utilizes in the classroom.

A Teacher Training Model

Basic premises and assumptions. There are a number of questions that address those factors to be considered in the development of a training process or model that provides teachers with the skills necessary to implement SLAMS in their classrooms:

1. How can teachers be sensitized to address the language needs of limited-English-proficient students in the mathematics classroom? What type of teacher incentive system should be incorporated into the training process?
2. What should be the content of the training, given the instructional model designed?
3. How should the training be conducted in order to best allow teachers to acquire the skills necessary for implementing the language approach to mathematics teaching?

Components of the training model. Based on the above three questions, the training model has three components: (1) an incentive component; (2) a procedural component; and (3) a content component.

- *Incentive component.* First, the teachers must be sensitive to the difficulties second language students experience in the classroom. Teachers must be aware that problems do exist for limited-English-proficient students in mathematics. There is the notion that since mathematics is a universal language, students, regardless of their proficiency in English, can master the concepts and skills with little trouble.[4] Second, there must be a reward system for teachers to become involved in the training process. Some of these extrinsic rewards may include college credit, stipends, or opportunities for materials development and classroom demonstration through release time from classroom instruction.

- *Procedural component.* This component deals with the actual procedures to be used for carrying out the training. These include:
  (1) Training activities which are varied and directed to the content of the training and the needs of the participants, including lectures, discussions, role playing, modeling, as well as problem-centered activities;
  (2) Provision for participants to have opportunities to generate ideas, activities, and materials as part of the training;
  (3) Provision of opportunities for demonstration, modeling, supervised observation, and feedback.

- *Content component.* In order to define the scope of the training based on the SLAMS model, the following areas of content need to be surveyed. The teachers':
  (1) Knowledge of the background and culture of the students, including any characteristics of the mathematics curriculum in the home language/country of the students;
  (2) Skills in teaching language in the context of mathematics, which includes a knowledge of the principles and techniques for teaching English as a second language;[5]
  (3) Knowledge of mathematics and methods for teaching mathematics at his or her grade level and content area;
  (4) Understanding of the linguistic demands presented by different classroom activities; it is assumed that group instruction, group tasks, and individualized learning require different linguistic skills from the teacher and the students (Christiansen and Wilson 1974).

Implementation of the Instructional and Teacher Training Models

A grant from the U.S. Department of Education allowed the University of Miami, Florida, in collaboration with a private research/consulting firm to implement the instructional and training models presented in this paper. The basic orientation of the project was to provide teachers with specific instructional and materials development strategies that incorporate a language teaching component within the mathematics lesson. Emphasis was made on the adaptation of existing teacher and commercial materials.

Approximately 250 teachers were trained through this project. Most of them were involved in the adaptation, development, and pilot testing of materials and teaching strategies that address the linguistic and cultural background of LEP students as well as the English language needs these students have in mathematics. Results of a research study conducted to examine the effects of teacher training on student achievement in mathematics are still in a preliminary stage at the time of this writing and are not yet available. I would like to offer instead some remarks concerning a sampling of the most salient experiences the teachers and project staff had during the implementation of the instructional and teacher training models.

- Some secondary teachers felt insecure in addressing language teaching concerns in the mathematics classroom; the project assisted them in developing some language teaching skills as a component of mathematics instruction.

- Most teachers who were trained to incorporate a language component into a mathematics lesson reported they were more aware of the language they used to communicate mathematical ideas, concepts, and skills to students; the teachers were more sensitive to the use of language in their teaching.

- From their experience, teachers reported that the language variable is only *one* of the many factors to be considered in teaching LEP students; familiarity with the student's academic background, culture, and learning style also need to be addressed in instructional activities.

In closing, let us remember that the student who comes from a home where English is the main language will have heard many of the linguistic structures used in the mathematics classroom. One cannot make the same assumptions for the second language learner.

Notes

1. Some of the conferences that have addressed the interaction of language and mathematics are: (1) the 1974 Nairobi Conference organized by UNESCO; (2) the 1975 Accra Conference organized by the Commonwealth Association for Science and Mathematics Education; and (3) the 1983 Mathematics Equity Conferences, organized by the U.S. National Council for Teachers of Mathematics (NCTM).
2. Dr. Phillip H. Mann and Ms. Rosemarie McClung collaborated with the author in the design and implementation of the instructional and teacher training models presented in this paper.
3. Valverde (1984), Tsang (1984), Bradley (1984) have identified these variables as language/culture, previous educational experiences, curriculum materials, instructional methods, teacher quality, and cognitive style.
4. Results of interviews with school administrators and teachers show that reference is made to *computational skills* when statements such as this one are made. Most of the educators interviewed agreed that the mathematics curriculum is more than just computation and that indeed, for other areas of mathematics instruction such as word problems, language (reading) plays an important role in the mastery of skills.
5. Reports by Christiansen and Wilson (1974, 24) and Morris (1974: 28, 51–52) from the Nairobi Conference have some thoughts on the matter of language teaching strategies within the mathematics classroom.

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Some Common Components in Training Bilingual, ESL, Foreign Language, and Mainstream Teachers

Denise McKeon

> In language teaching the life and death of an idea rests mainly on the teacher who is to apply it. The fate of an idea in the classroom depends on the concepts and instincts a teacher has received from his training and the amount he is required to do. (Kelly 1969, 384)

What is that fate of the ideas now emerging from research regarding the total educational development of limited-English-proficient (LEP) students? How can teacher training and teacher preparation programs best provide the necessary conceptual growth and skill development for the numbers and kinds of teachers currently involved in the English acquisition process of such students? Is the amount we are asking teachers to do in the classroom reasonable, or even feasible, given the availability of classroom support systems that help translate theory into practice? Where do we start in order to ensure the survival and healthy implementation of such promising theoretical models?

Perhaps the first step is in providing more relevant training by identifying the population to be trained, the skills and knowledge this population brings to the training experience, and the broad research themes whose classroom applications may be fully exploited through the training process.

In their presentation of the Teachers Language Skills Survey (TLSS), O'Malley and Waggoner (1984) provide key descriptions of the training and preparation of teachers working with LEP students. O'Malley and Waggoner state the following:

- Approximately half of all public school teachers in the United States have immediate or previous experience with LEP students in their classes. Of these teachers only about 6 percent have taken even one academic course to learn how to teach English as a second language (ESL).
- Only 30 percent of the teachers who reported that they taught ESL had received at least one course in ESL. Additionally, ESL teachers

were more likely than teachers in general to be teaching in preschool or the early grades. Acheson (1977) reports that most teacher preparation programs in English as a second language prepared trainees for jobs at the secondary level.

- Teachers teaching ESL and using a non-English language for instruction are twice as likely to have had ESL preparation; about three-quarters had taken at least one course in ESL.
- Approximately 35 percent of teachers teaching ESL had experience in teaching a foreign language, compared to less than 10 percent of teachers in general.

Thus we find four distinctively different groups of teachers directly responsible for the ESL instruction of LEP students: (1) regular classroom or mainstream teachers, (2) ESL teachers, (3) teachers using a non-English language or bilingual teachers, and (4) foreign language teachers.

What do we know about the specific training and preparation that each type of teacher brings to the ESL situation? To what degree are any discipline-specific skills or general training previously received appropriate to the current ESL teaching situation of each? In order to determine the relative comparability of teaching preparations, we turn to sets of standards developed for teacher education programs (see table 1). These standards, while varying across institutions with regard to the nature and degree of implementation, afford, at the minimum, an overview of the nature of previous training that teachers in the four categories can be reasonably expected to have. Table 1 (see page 100) illustrates a fair amount of overlap with regard to standards set for the first three groups of teachers: bilingual/bicultural, ESL, and foreign language. The degree of overlap of the first three categories with the fourth, that of mainstream teachers, is negligible (except for the multicultural component). However, if the first group of teachers (bilingual/bicultural) is compared with the fourth group (mainstream), the standard which states that bilingual teachers should "possess a standard credential in another area of certification" (table 1, column) suggests a different pattern of overlap. Additionally, if the grade level focus of professional preparation is taken into account, both the ESL and foreign language preparation programs are more likely to be directed toward students preparing to teach at the secondary level (Acheson 1977; Rhodes 1985).

Overlaps in teacher preparation requirements, commonalities in discipline-specific standards, and similarities in training for dealing with like groups of students (minority language students, elementary or secondary level students) implies that differentiated grouping (certain types of teachers grouped for certain types of topics) may help to intensify both the focus and specificity of training (McKeon, in press). Attention not only

to common needs but also to common preparations may make the process of organizing, designing, and implementing inservice training activities more effective.

In addition to capitalizing on similar teacher preparation, we must begin to identify areas of training that not only assist practitioners in achieving more comprehensive standards than were previously necessary but that also provide practitioners with the necessary support to translate newer theory into practice.

Emerging research across the four discipline areas (bilingual, ESL, foreign language, and mainstream education) shows evidence that specific topics within several broad themes are surfacing in the literature of each of the disciplines almost simultaneously (see table 2, page 102). It would appear that this convergence, this commonality of research topics—represented not only in the literature specific to linguistic minority education but also to mainstream education as well—would provide a cohesive framework from which to develop training. (Table 2 should in no way be considered a comprehensive treatment of all currently emerging themes or currently available research. It is, rather, a brief overview.)

While the research themes have been somewhat arbitrarily placed into certain disciplines and topic areas and may, in many cases, have emerged in ESL and bilingual categories simultaneously—e.g., Cummins (1979), Wong Fillmore (1979), Krashen (1982)—the dual nature of the applicability of these themes is even stronger support for including such research as viable training topics.

Training developed from a common, yet multidisciplined research base (one that speaks to the specific preparations of the groups of teachers involved) may allow for the fine tuning of teacher education by allowing teacher trainers to reinforce, refine, and expand topics through a comparative analysis of the research.

Table 1

Bilingual/Bicultural,* ESL,* Foreign Language,* and Mainstream Teacher Education Standards: A Comparison**

Bilingual/Bicultural	ESL	Foreign Language	(General) Mainstream
Programs must ensure that students possess: • Standard teacher's credential in another area of certification • Proficiency and the ability to instruct students in English and target language • Knowledge of history/culture of target population and the U.S. • Ability to adapt materials • Learning experiences in sociology and linguistics • Ability to relate to students, parents, community members	Programs must ensure that students possess: • Personal qualities that contribute to success as teacher, assure respect for students and their culture • Experience in learning another language, knowledge of another culture • Knowledge of general linguistics and applied linguistics and their application to language teaching • Knowledge of the ways in which L_1 culture and L_2 culture differ	Programs must ensure that students possess: • Knowledge of work in phonology, composition, and linguistics of L_2; literature • Proficiency in L_2 (spoken and written), including: — Awareness of differences between L_1/L_2; ability to apply awareness to teaching — Knowledge of ways in which L_1 culture and L_2 culture differ — Knowledge of language pedagogy	Programs should consist of: • Multicultural component—knowledge of such issues as participatory democracy, racism/sexism, values clarification, linguistic variation/learning styles Special education component including ability to: — Recognize and refer exceptional learners — Contribute to design/implementation of curriculum

- Proficiency in teaching methods
- Awareness of dialectal differences
- Awareness of differences between L_1/L_2; ability to apply awareness to teaching

- Knowledge of language acquisition—L_1, L_2; sociocultural variables in language learning
- Knowledge of language pedagogy
- Knowledge of testing principles; assessment of language proficiency
- Understanding of uniqueness and interrelationships of various life styles in a pluralistic society
- Proficiency in spoken and written English

- —Knowledge of specialized techniques (media use)
- —Knowledge of relationship of foreign language study to other areas of the curriculum
- Knowledge of literature, history, geography, contemporary civilization of appropriate countries

- —Accommodate learners through instructional techniques/management strategies
- General studies including:
  - —Symbolics of information—
    (1) languages, linguistics
    (2) math, logic
    (3) information theory
  - —Natural/behavioral sciences
  - —Humanities
- Professional studies, including:
  - —Content for the teaching speciality
  - —Humanistic/behavioral studies
  - —Teaching/learning theory including clinical experience
  - —Practicum

National Association of State Directors of Teacher Education and Certification (1977).
**National Council for Accreditation of Teacher Education (1982).*

Table 2

Common Research Themes Across Disciplines: A Sampling

Themes	ESL	Bilingual	Foreign Language	Mainstream
1. Learning and linguistic theory and research, including the identification, development, and use of strategies (cognitive, linguistic, metacognitive, and social)	Chamot and O'Malley 1984 Dulay and Burt 1977 Dulay, Burt, and Krashen 1982 Krashen 1982 O'Malley et al., in press Ventriglia 1982 Wong Fillmore 1979 Wong Fillmore and Swain 1984	Cummins 1979 De Avila 1984 De Avila and Duncan 1979	Asher 1982 Byrnes 1984 Gingràs 1978 Krashen et al. 1984 Stevens 1984	de Bono 198 Goodman 1985 Guilford 1967 Jagger and Smith-Burke 1985 Sternberg 1984 Wagner and Sternberg 1984
2. Language and the content areas; the interrelatedness of learning	Cuevas 1984 Krashen 1982 Saville-Troike 1984	Cummins 1979 Dawe 1983 De Avila 1984 Kessler and Quinn 1984	Campbell et al. 1985 Lambert and Tucker 1972 Rivers 1985 Savignon 1983	Booth Olson 1984 Fulweiler and Young 1982 Taba 1964
3. Instructional design/instructional organization based on linguistic/cognitive theory research	Chamot 1983 Krashen and Terrell 1983 McKeon 1985	De Avila 1984 Yawkey 1982	Met 1984 Terrell 1977	de Bono 1981 Labinowicz 1980 Meeker 1969 Michaels and Foster 1985 Weikart et al. 1971

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Models of Inservice Teacher Training

Carmen I. Mercado

The title of this paper is unintentionally misleading. What is described in the narrative which follows is not inservice models, but rather one emerging research-based approach for addressing the concerns of Title VII personnel. To be more precise, the approach is one that gives form, meaning, and direction to the training and technical assistance activities of the New York Bilingual Education Multifunctional Support Center (BEMSC). For this reason, basic information about the project and the context in which it functions are also discussed.

As some may already know, the BEMSCs are federally funded centers contracted "to design and implement support services in bilingual education so as to provide educational personnel and community participants with a cohesive and well-organized system of supportive services for improving the quality and content of ongoing Title VII and other bilingual education programs" (U.S. Department of Education 1983). Support services that may be categorized as inservice training or staff development efforts include formal activities, which are intended to direct the growth of knowledge and skills, and technical assistance to individual districts for the design and implementation of local activities.

Since the staff of the center is committed to the application of sound theory and research findings to instruction and training—particularly now that a great deal of information has been generated by the Part C Research Agenda studies—we actively seek to promote the analysis and utilization of this information by serving in the following capacities:

- As information brokers, disseminating information about current research and theory pertinent to instruction for limited-English-proficient (LEP) students, demystifying it, and making it useful;
- As providers of support to individual school districts, demonstrating ways in which research and theory may be incorporated into the planning of district-based inservice activities;
- As capacity builders, working with teachers and teacher trainers to develop appropriate applications of research and theory and preparing these professionals to serve as resource personnel within their districts.

In effect, our purpose is to promote decision making based upon the best information we have available and to extend the range of resources districts may rely on to improve instructional services for LEP students.

However, in providing our services, we have had to deal with three basic realities which affect how we approach training. First, the New York BEMSC operates "from the outside looking in" both because it is separate from the school systems that it serves and because its services are considered supplementary to those provided at the school and district level. Thus, how we promote participation in our activities and how we provide follow-up assistance are two areas that have posed a special challenge to our creativity. It should be pointed out, however, that these problems are not unique to the BEMSCs; they are problems of inservice training for schools and districts as well as for institutions of higher education.

Second, our school- and district-based colleagues often confront multiple demands and responsibilities, which make their time a limited and precious commodity. While we may seek to enter into partnerships with them to design activities that address their concerns, asking these individuals to meet with us to plan or to be available to share their experiences with others is not as simple as it sounds—no matter how committed both parties may be to collaboration.

Lastly, we are fully aware that research and theory have tended to have little influence on practice. We believe that school and district personnel may have confused or negative perceptions and attitudes toward research, not because they are incapable of appreciating its value or understanding its implications, but because the presentation of research and theory requires specific sensitivities and skills that go beyond what researchers and theoreticians should be expected to do. As a result, we have assumed the responsibility of serving as mediators of research—demonstrating how research and theory suggest ways to improve instruction or to determine the content and process of training in an objective and systematic manner. Needless to say, providing our services while also developing these applications has not been easy to orchestrate.

We are attempting to deal with these realities and to promote professional development through an approach that is personal/informal, collegial, reflective/analytical, accommodating, and interactive. However, I am compelled to state that while this approach represents empirically validated principles and procedures, some of what is described here was initially developed on the basis of intuition, experience, and innate sensitivity to what was appropriate and what was not. I became involved in training, as many of us have, with little preparation for the job and often found it overwhelming to learn about my new role while also keeping up with the professional literature—however scant it may have been in the late 1970s. I call attention to this to make the point that it is possible to develop sound instructional and training practices in the absence of

research. Indeed, research serves to validate and explain what we do as much as it influences what we do.

As was previously stated, the New York BEMSC endeavors to set the course for the professional development of its clientele by means of an approach which is personal/informal, collegial, reflective/analytical, accommodating, and interactive.

Personal/Informal

We do not endeavor to change the behavior of our colleagues in the field, but rather to establish channels of communication, cultivating relationships based on trust and mutual support. This is essential to the provision of useful, timely services and is a means of gaining access to local resources and support personnel.

The past year, in particular, has been especially fruitful in the number of close working relationships we have been able to establish. Our success has been due in large part to the following factors.

Providing timely help. We have been supportive of locally initiated efforts, either by being physically present to help out if our schedules permitted, or otherwise by telephone. In short, we have gotten to know our colleagues as individuals and have gained their confidence by being there when we were needed. Moreover, we have gained valuable insights about the concerns of program staff that no formal meeting or questionnaire could have brought to light.

Observing and learning from others. In order to understand the realities of day-to-day operations in a given school or district, we have visited classrooms frequently, observing and learning from others as they follow their usual routines, confronting problems, and making decisions. (I cannot help but wonder how much I would have missed if I had not supressed the tendency to make judgments and had not left myself open to the experience of classroom life as it is, rather than as one thinks it should be. As a result, I have walked away from certain experiences convinced that sometimes practice does defy theory!) Indeed, demonstrating to others that we want to understand their situations, that we want to learn from them, has prompted these professionals to seek out our assistance and advice on those things about which they feel sensitive or uncertain. Difficult as it may be to believe, school and district personnel often do not have the opportunity to discuss their experiences with "nonjudgmental others." For us, this has provided an invaluable opportunity to learn about the diversity of contexts in which instruction for LEP students occurs. We have used this information to "fine tune" our activities, focusing them more sharply on the realities our colleagues experience.

Using what we know to make others look good. We use every available opportunity to call attention to those procedures and techniques we

observe, that are thought to be important, but which our colleagues may not have had the time to realize. We know from firsthand experience that having one's practice validated by research dispels doubts, develops self-assurance, and leads to more systematic behaviors. Moreover, highlighting the importance of research in explaining practice suggests to others that they are doing something right. Unfortunately, teachers, in particular, often express fears of research because the message that is subtly conveyed when it is presented to them is that they are doing something wrong and that their behaviors need to be changed.

Collegiality

We are committed to supporting and providing a forum for our colleagues in the schools and districts to share experiences and techniques that they have found to be successful or have generated from research to deal with particular areas of concern or interest. We have also been collaborators and mentors, working as professional equals with interested colleagues, making presentations, sharing and exploring, reflecting together. This collegial approach is beneficial to all in that it lessens the feelings of isolation that most have experienced. It also contributes to the participants' professional development in a way that no formal activity or workshop could possibly match.

Reflection and Analysis

Reflection and analysis is a means of guiding others to analyze, understand, and clarify misconceptions and deal with behaviors and situations that arise in the course of a typical day. Since the routines and pace of the school day do not usually allow for reflective time and since traditional inservice programs have tended to be prescriptive, we believe that this type of introspection is essential if one is to understand situational factors that affect instruction. This introspection also provides the impetus for self-initiated, self-directed, and self-evaluated learning, without which professional development is not possible. In effect, guided reflection places the teacher or teacher trainer in the role of the researcher, rather than being the object of someone else's inquiry.

Accommodation

In order to meet the needs of individuals at different stages of professional development who have different learning styles, the training activities of the center have been designed to accommodate diversity. Thus, our major instructional activities vary in terms of the following:

- The characteristics of the participants (Who will be involved?)
- The incentives for participation (Why are they involved?)

- Sponsorship and decision making (Who initiates and plans the activity, and why?)
- Location and scheduling (When and where?)
- Duration (For how long?)
- The goals and focus of the activity (What is the purpose?)
- The form of the activity (What format will be used?)
- The training approach and techniques (What is appropriate?).

Specifically, four major types of activities are offered in addition to individual technical assistance. The Trainers' Seminar is a series of monthly, full-day sessions (six to seven in total) intended to present information on the content and process of training—information that is empirically derived as well as based on what our colleagues in the field consider to be effective. A combination of lectures and discussions is used to present the information, and small-group analysis is used to explore the information's utility and application. During these sessions, participants are also given time to share, discuss, and reflect on problems and concerns they have identified as being important. It should be emphasized that participants are especially eager to find out the extent to which their problems are shared by others and to learn how others are coping with these. In effect, while the planning of these sessions is based on information that has been gathered during our planning period (also referred to as needs sensing or needs assessment), the focus of each session is additionally sharpened to reflect the specific concerns of those attending each session.

The Instruction and Management Fair is a one-day event held during nonschool hours for purposes of sharing and displaying programs, materials, techniques, and strategies that are used by school and district personnel to provide instruction for LEP students. What is perhaps most significant about this event, beyond the incredible networking that it promotes, is that it involves working closely with our colleagues to accomplish a specific purpose. Representatives from the center meet regularly with representatives from schools and districts who, through a group decision-making process, advise us on the form and content of the activity. Recommendations are also made as to who should lead the various sessions. This past year, four such fairs were held; one in each of the major regions in New York State—New York City, Long Island, western New York, and the mid- and upper Hudson Valley area. Each fair was as unique and different as each of these areas.

The Language Development Specialist Academy (LDSA) brings together teacher representatives from throughout the state who have been nominated for participation by school and district personnel because

they are considered to be effective at promoting language development. The 20 or so individuals who are accepted for participation meet for ten full sessions; five Saturdays a month during the school year and one week during the summer. All travel costs are reimbursed and stipends are provided. Through the activities of the LDSA, participants engage in dialogues with researchers, learning about and commenting on the researchers' findings. The teacher representatives use this information to gain a greater understanding of their instructional practices, but also to seek appropriate application of the research to practice. Materials that are developed through these sessions are being shared locally and eventually will be made available for wider dissemination.

The center also conducts two issue-oriented roundtables, one focusing on issues related to instruction for LEP high school students and the other on issues related to the role of language in learning. Both are full- or half-day events for nonclassroom personnel—e.g. program coordinators, teacher trainers, principals, and superintendents.

Interactive

Our approach is interactive in that while we believe in the power of research to explain, influence, and validate practice, we also recognize that practice can inform and validate research. It is important that we keep an open mind and be receptive to all possibilities as we acquire greater understanding of the incredibly diverse and complex situations in which instruction for LEP students occurs. For this reason, what we have chosen to highlight about our approach is not the content, but the process we follow. It is evident from what has been indicated in the preceding narrative that we derive the content of training from two primary sources: (1) effective techniques and approaches identified by our district-based colleagues and (2) the empirical and theoretical literature in areas related to instruction, inservice education, and adult learning. The results of the first series of Part C Research Agenda studies dealing with effective instructional practices, as well as more recent findings of effective inservice education, have been especially useful in addressing questions and concerns which Title VII program staff have made known to us.

Many details of our approach have been omitted for the sake of brevity. What has been described are those aspects that are basic to the way we provide services. Needless to say, we have gained many insights as we have worked with others to accomplish the goals of the BEMSC. The following four are particularly significant:

- Our inservice activities have had reciprocal benefits since they have contributed as much to our professional development as we have been told they have contributed to the professional development of our clientele.

- Informal activities in which assistance and support are provided through consultation, problem analysis, and collaborative planning are as important for addressing professional concerns as are the more formal activities of the center, or even more so. In particular, we have been able to provide onsite assistance and follow-up to formal activities through our technical assistance efforts.
- Given the diversity of instructional settings in which instruction for LEP students occurs, it is essential that we periodically ground ourselves in the realities of those settings for which activities are to be designed.
- Working on activities that are not typically associated with inservice training, such as making presentations, designing staff development programs, or developing research applications, is a powerful means of promoting professional development while also meeting some of the real needs of the districts and of the center.

It would leave an incorrect impression to close this discussion without acknowledging that several aspects of the training approach used by the New York BEMSC will be reworked and refined in the coming year. Specifically, we are concerned with developing what Hunter refers to as *conditional knowledge*. "Conditional knowledge is the essence of translating science into artistry in teaching" (Hunter 1985, 58). In essence, it is knowing how to adapt or modify research findings to instructional practice in various classrooms.

We are also planning to make more systematic use of individuals who have participated in intensive activities—i.e., Language Development Specialist Academies and the Trainers Seminars—as workshop leaders and presenters for future activities, such as the Instruction and Management Fairs. Moreover, we recognize the need to develop procedures and techniques that districts can follow to take advantage of the heightened skills of their educational personnel who have received training from the center.

As one can see, there is much that needs to be done.

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Training Teachers To Develop the Academic Competence of LEP Students

Muriel Saville-Troike

Looking through the literature on what a student needs to know to succeed in school, i.e., what constitutes academic competence, we find that such competence is generally defined in terms of *skills* and *strategies*, certain types of *knowledge*, and *attitudes* toward learning. Language skills required for the attainment of high academic competence include the ability to decode and encode meaning in context-reduced tasks (especially reading and writing) and to use language as a tool in acquiring knowledge and in performing analytic processes. Strategies include listening or reading for the main point, outlining and summarizing information, making comparisons and contrasts, generalizing, making logical inferences from known information, and constructing schemata. The knowledge referred to is seldom of language per se, unless it is in a language arts or English class dealing with grammar. For elementary and secondary school students, what matters is primarily conceptual knowledge and schemata in such curricular areas as mathematics, science, social studies, and history. The most obviously important aspect of language for the development of these concepts is vocabulary, followed by the means for the expression of semantic relationships. The requisite attitude for academic success is a variable construct in many respects, but, as a minimum, it must include a disposition on the part of the student to make efforts at conscious and intentional learning and the belief that these efforts can make a difference.

While a student's academic competence is influenced to a great extent by factors outside of the school's control, such as personality, inherent intelligence, prior social experiences, parental attitudes and behaviors, and culture—such competence is also one aspect of development about which we can say teaching really does make a difference. The question to be addressed here is how teacher training may contribute to the academic competence of limited-English-proficient (LEP) students.

In table 1 (see page 116), I have listed the teacher qualifications that I believe are likely to be most important for developing the academic competence of LEP students in the categories of knowledge, abilities, and

Table 1

Teacher Qualifications Relevant to All Three Groups of Teachers Involved with LEP Students: Bilingual, ESL, and Mainstream*

Knowledge

- The nature of language, and language change and diversity.
- The interrelationships of language and cognitive development.
- Theories of first and second language acquisition/learning and their implications for the classroom.
- Effects of cultural and socioeconomic factors (both of majority and minority groups) on students' learning styles (cognitive and affective) and on students' general level of development and socialization.
- Linguistic, rhetorical, and stylistic concepts that furnish useful ways of understanding and talking about the substance, structure, development, and manner of expression in written and oral discourse.
- Processes by which one learns to read and write.
- Instructional resources (including educational technology) and varied sources of information that will help students understand—through intellect and imagination—the subjects and issues they are studying.
- State and local curriculum requirements and guidelines.
- Scope and sequence of content in all subjects being concurrently studied by the students.
- Problems faced and procedures used by teachers and educational leaders in designing curricula in English for students of different ages, abilities, and cultural/linguistic backgrounds.
- Major research studies on the relation of language acquisition to academic development in children and adults, on reading, on processes of composing, and on building of curricula for different kinds of students in different settings.

Abilities

- Communicating effectively.

*Selected and adapted primarily from teacher training guidelines developed by the Center for Applied Linguistics (1974) and the National Council of Teachers of English (1976).

- Using teaching strategies appropriate to distinct learning modes and developmental levels.
- Identifying, assessing, and interpreting student progress in all language skills, particularly those relevant to academic content and performance.
- Organizing groups of learners for a variety of purposes appropriate for language development (for example, discussion, creative problem solving, composing, and commenting on compositions) and enhancing peer teaching and learning.
- Asking questions (at varying levels of abstraction) that elicit facts, opinions, and judgments appropriate to the subject, the occassion, and the student's level of language competence.
- Helping students respond appropriately to the differing demands (particularly academic) of speech and writing in different contexts and for different audiences and purposes, and developing students' level of metalinguistic awareness.
- Helping both beginning and maturing readers apply varied techniques to improve reading comprehension and inferencing abilities.
- Helping students learn to listen effectively for information and for understanding.
- Helping students identify and weigh facts, implications, inferences, and judgments in both spoken and written discourse.
- Selecting and adapting materials and methods in accordance with:
  (1) Suitability to each student's language proficiency and cultural experiences;
  (2) Provision and respect for linguistic and cultural diversity;
  (3) Objectives, scope, and sequence of the content areas;
  (4) Students' responses.

Attitudes

- Genuine and sincere interest in the education of students regardless of their linguistic and cultural background; personal qualities that contribute to success as a classroom teacher.
- Sensitivity to biases and deficiencies in existing curricula as well as in commercial and teacher-prepared materials of instruction.
- Flexibility in teaching strategies and willingness to seek a match between students' needs and the teachers' objectives, methods, and materials.

attitudes. Selected and adapted primarily from guidelines developed by the Center for Applied Linguistics (1974) and by the National Council of Teachers of English (1976) for the preparation of teachers, these qualifications are relevant to *all three* groups of teachers that LEP students at the elementary and secondary school levels are most likely to encounter: (1) the regular mainstream or content area teachers of English-medium classrooms; (2) the bilingual teachers who instruct through the medium of the students' L_1 as well as English; and (3) the ESL teachers who focus on the development of the second language code. Training programs and credentialing requirements for the three groups are often quite separate, and I wish to argue that this should not be the case.

Teacher education for all groups requires *un*learning assumptions and misconceptions which can range from the simplistic notion that language differences in themselves are enough to account for the relatively low academic achievement of minority group students in our schools to the assumption that students who are competent in face-to-face social interaction have the language skills required for academic competence. The foundation for all programs should thus include knowledge about such topics as the interrelationships of language and cognitive development—from the classic work of Piaget and Vygotsky to recent contributions by Bruner, Cummins, Snow, and others who are active in this field—and about the processes of language acquisition and learning. Such a knowledge base is necessary because there are no "cookbook" approaches that are going to guarantee maximal academic competence for LEP students; the most effective teachers will be those who can adapt and modify curricula for students' special needs and cultural characteristics. This requires understandying *why* as well as *what* to do.

Training programs for specialists in ESL, which usually provide for the areas of knowledge I have listed, might come under the heading of "applied linguistics," but these programs frequently omit areas of knowledge that represent what the linguistics is supposed to be applied to, including the curricula of elementary and secondary education. The central message that I want to deliver here is that ESL teachers cannot contribute effectively to the development of LEP students' academic competence if the teachers do not know what academic content students are expected to learn. Teachers must also understand the developmental processes of reading and writing as well as of oral communication. Within each of the knowledge areas listed in table 1, the specific information and the relative depth of information a teacher must have depend on the level and domain of instruction, but knowledge in all areas is needed.

The teaching abilities listed in table 1 are most often included for regular classroom teachers under the program heading "language arts." A survey of recent textbooks in that field indicates that major emphasis is

indeed being placed on: (1) providing for different levels of cognitive and linguistic development; (2) organizing classrooms so that students can teach and learn from each other; (3) using language in critical thinking tasks; (4) enhancing metalinguistic awareness; and (5) integrating skill development with content area learning. Major progress has recently been made in research on reading and composition, and this is being reflected in language arts methods texts and courses. There are major discontinuities, however, that occur across training program lines.

Otherwise excellent texts for English language arts often include a page or two on what to do with LEP students in the classroom in case the school does not have an ESL or bilingual program, with suggestions that do not reflect current knowledge about second language acquisition. ESL training, on the other hand, often introduces reading (if at all) with overemphasis on decoding, as in the outdated Linguistic Method, without apparent input from current knowledge about the nature of reading comprehension and skills development. The best of what has been developed in English language arts could also be profitably applied in teaching other native language arts, but this latter component is generally neglected in bilingual teacher training except for teaching initial literacy.

It seems clear that most components of academic competence—including context-reduced language skills, strategies for learning, and the concepts which are learned—are either code independent or transfer quite readily from one language to the other. It seems equally clear that the qualifications needed by teachers to foster students' academic competence are essentially the same, whether they are labelled regular/mainstream, bilingual, or ESL. I am not the first to say "good teaching is good teaching," but that fact makes the statement no less important on this occasion. LEP students will ultimately profit most from the same kind of teaching excellence that benefits all other students. Program boundaries exist because of the different disciplines from which regular teaching, bilingual education, and ESL arise. I believe it is vitally important to synthesize our efforts both within the educational experiences of LEP students and across the educational programs that train teachers.

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